

anxp

NH

467

p89

no.13

THE PRACTICAL PHOTOGRAPHER

(LIBRARY SERIES)

EDITED BY REV. F. C. LAMBERT, M.A.

NUMBER 13

The Pictorial Work of
J. Craig Annan.

The Carbon Process.

By . .

H. W. Bennett, F.R.P.S.,

T. Thorne Baker, F.R.P.S.,
F.C.S.,

H. Inkpen,

E. Staddon,

F. Pinder,

R. R. Rawkins,

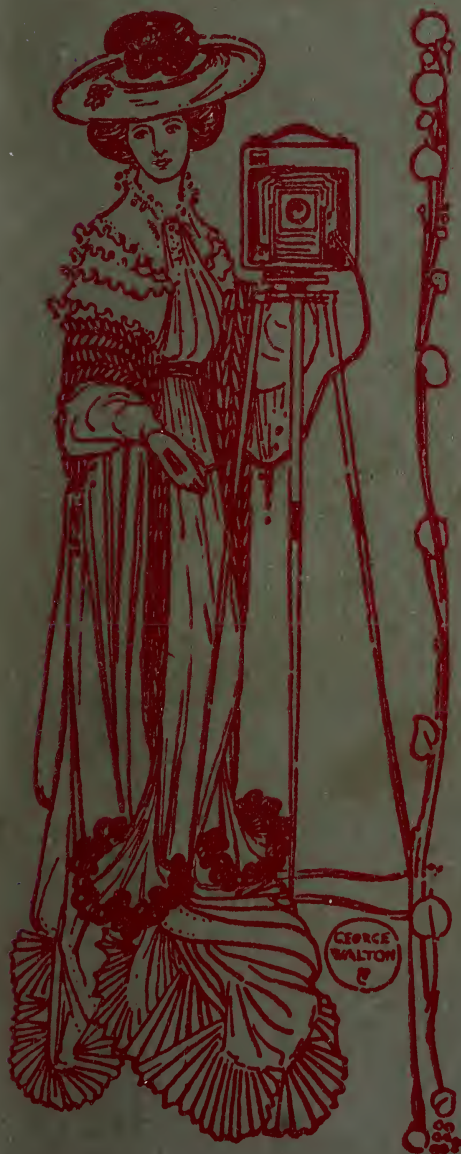
and Others.

Profusely
Illustrated.



HODDER AND STOUGHTON,
27. PATERNOSTER ROW, E.C.

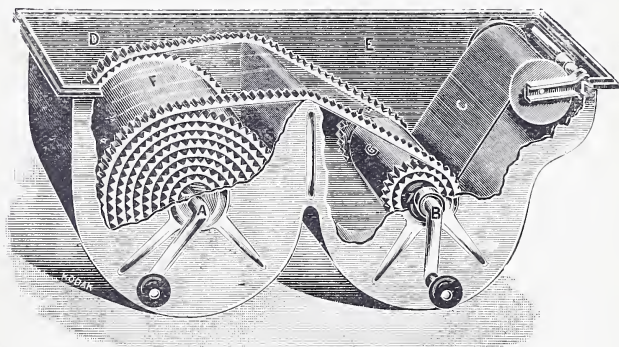
October, 1904.



To develop your Holiday Films it is not necessary to resort to a suffocating dark-room; the safest, surest, and most time-saving method of developing films is by the use of the

**KODAK DAYLIGHT
DEVELOPING MACHINE.**

It isn't only that you save time, and that you can develop your films with comfort in any light and anywhere; it is that the results are so much better.



The proof of the complete success of the Kodak Developing machine lies in the fact that it is in everyday commercial use, and better negatives in every way are turned out by it—clear, bright, free from finger markings, scratches, etc. Uneven development is unheard of.

You can see the Developing Machine in work at most dealers', or at any of the Kodak branches. It will convince you that there is only one successful method of developing roll films.

MAY BE OBTAINED FROM ALL DEALERS, or from

Kodak, 57, 59 & 61, Clerkenwell
LTD. Road, LONDON, E.C.

Wholesale and Retail Branches: 96, Bold Street, Liverpool;
and 72-74, Buchanan Street, Glasgow.

Retail Branches: 59, Brompton Road, S.W.; 60, Cheapside, E.C.;
115, Oxford Street, W.; 171-173, Regent Street, W.;
and 40, Strand, London, W.C.

THE BEST NEGATIVES
FOR
EVERY PHOTOGRAPHIC PRINTING
PROCESS
ARE TO BE OBTAINED ON

ILFORD
PLATES.

OF ALL DEALERS.

382 Cash Prizes
amounting to **£750**
are offered in the Ilford
Photographic Competition,
open to the World.

*Particulars from all Dealers, or post-free direct from
Ilford, Limited, Ilford, London, E.*

The Practical Photographer

Library Series. The Carbon Process.

No. 13.

Principal Contents.

	PAGES
The Pictorial Work of J. Craig Annan, with an Essay by the Editor. (Eight illustrations) - - - - -	1
Practical Introduction to Carbon Printing, by H. W. Bennett -	6
Carbon Transparencies, by Harry Inkpen - - - - -	30
Carbon Process for Winter Evenings, by F. Pinder - - - -	33
An Effective Actinometer, by R. R. Rawkins - - - - -	34
Carbon Wrinkles, by Harry E. Staddon - - - - -	36
Chemical Aspect of Carbon Printing, by T. Thorne Baker -	38
Chemical Notes for Carbon Workers, by J. H. Watson - - -	42
Bichromate Poisoning, by R. Dale - - - - -	43
Jottings—Transparencies, Cutting Up Tissue, Single Transfer, Collodion Surface, Ivory Transfer, Intensifying, Toning and Reducing Carbon Prints, Reproducing Negatives, Cloud Printing, Combination Printing; Prints on Opal, Silk, Canvas, Wood, etc.; Defects and Failures; Mounting, Sensitizing, etc. - - - - -	45
Formulae, Hints, etc. - - - - -	64

Illustrations.

FIGURES.		FACING PAGES
1. "Janet Burnet."	J. Craig Annan - - - - -	1
2. "Utrecht Pastoral."	" - - - - -	4
3. "The Church and the World."	" - - - - -	5
4. "Fishers' Wives."	" - - - - -	8
5. "In a Garden Fair."	" - - - - -	9
6. "Summer."	" - - - - -	12
7. "Reflections, Amsterdam"	" - - - - -	16
8. Portrait Study. E. Hoppé - - - - -	- - - - -	17
9. Professor Young. J. Craig Annan - - - - -	- - - - -	20
10. "Wind Swept Moor." R. D. Percival - - - - -	- - - - -	24
11. "The Smith." T. Taylor Smith - - - - -	- - - - -	25
12, 13. Controlled Development. H. W. Bennett - - - - -	- - - - -	28
14, 15. Exposure Variations. " - - - - -	- - - - -	29
16. "On the Top of the Tide." F. C. Lambert - - - - -	- - - - -	32
17, 18. Fresh and Stale Tissue. H. W. Bennett - - - - -	- - - - -	36
19. "Aimée." S. Cardwell - - - - -	- - - - -	37
20. "Homeward by the Evening Light." A. H. Avery - - - - -	- - - - -	40
21. "The Blacksmith." W. H. Rundle - - - - -	- - - - -	41
22. "Evening on the Wear." W. Milburn - - - - -	- - - - -	44
23. Decorative Flower Study. R. Barrett - - - - -	- - - - -	45
24. "Cramond Brig." J. R. Sandilands - - - - -	- - - - -	48
25. "Sunshine and Snow." M. Bruce - - - - -	- - - - -	49
26. "Poppies." A. T. Lakin - - - - -	- - - - -	52
27. S. Aisle, Buildwas Abbey. E. H. Day - - - - -	- - - - -	53
28. The Clerestory, Winchester. S. G. Kimber - - - - -	- - - - -	56
29. "Roses." E. Seymour - - - - -	- - - - -	57
30. "Through Parting Mists." J. Linley - - - - -	- - - - -	60
31. "Sister Hephzibah." Mrs. H. Morgan - - - - -	- - - - -	61

Editorial and other Notes.

Contents of Our Next Number.

Our next issue of the present (Library) Series of *The Practical Photographer* (ready November 1st) will deal in a practical and exhaustive manner with the very important subject of **Retouching the Negative**.

Our fifteenth number (ready December 1st) will (probably) be devoted to the seasonable topic of **Winter Work**, *i.e.*, Landscapes—with and without Snow, Ice, Hoar Frost, Winter Work Indoors, etc.

Other numbers in active preparation will deal with **Gum-bichromate Printing, Portraiture, Flowers, Animals, Marine and Seascape, Clouds, Genre, Lenses, Night Photography, Chemistry, Orthochromatic Photography, Telephotography, Ozotype, Iron Printing Processes, Optical Lantern, Stereoscopy, Flash-light Work, Finishing the Print, Combination Printing, Pictorial Composition, Photo-micrography, Figure Studies, Copying, etc.**

N.B.—Will readers who feel disposed to co-operate in the preparation of any of the above numbers kindly communicate with the Editor forthwith?

Hints for Intending Contributors.

The Editor will be pleased to carefully consider MS. bearing on any of the subjects announced. Preference will be given to MS. characterised by the following features :—

1. New or little known methods; formulæ personally tested.
2. Short sentences and simple language, with diagrams when needed.
3. Brevity so far as is consistent with clearness. The first and last pages of the MS. should bear the sender's name and address. The approximate number of words should be stated. Contributors may, if they please, send a brief outline or synopsis of their proposed contribution.

The Editor cannot undertake any responsibility whatever in connection with MS., but if stamps are sent for return postage, he will endeavour to return as quickly as possible any MS. not accepted for publication. MS. should reach the Editor not later than **six weeks** before date of publication.

Intending contributors will also find that it saves themselves trouble if they will send to the Editor an *outline* of their proposed communication at the earliest possible date, so that arrangements may be made to avoid overlapping by two or more contributors saying the same thing. In this first communication any proposed diagrams may be merely rough sketches.

In general it is well to put any drawings or diagrams on separate sheets and not interpolate them with the matter.

The MS. pages (which may preferably be typewritten) should have a clear margin of quite an inch left blank along the left-hand side of the page.

NOTE.—It would frequently save disappointment and the return of MS. if authors would state their willingness for extracts to be made from their contributions if the contribution cannot be accepted in its entirety owing to overlapping or duplication of portions by other contributors.

Criticism of Prints.

It is our desire to make the criticism of prints a special feature in our pages. The Editor gives his personal careful attention to this matter, and aims at making every criticism a practical, interesting, and instructive object-lesson. By paying attention to the hints thus given, often a poor print may be improved and a good print followed by one still better. In order to encourage readers to take great care in the preparation of the prints they send us, we offer **Three Prizes of Five Shillings** each, for the three best prints sent in each month. The winning prints will not be returned.

THE PRACTICAL PHOTOGRAPHER.

Print Criticisms: Awards.

The competitors this month have run each other very close indeed. The first award goes to Zeph Carr, "Through the Woods." The other two prizes have been divided between F. G. Price, "At the Foot of the Tree"; Arthur Turner, "The Lonely Birch"; Mrs. Paul Mason, "At the Cottage Door"; H. S. Prince, "The Story Teller." Highly commended: E. G. Elbourne, E. Ross, A. Bracewell.

Midg Competition: Award.

A. Clark. Highly commended: J. H. Wilson, B. A. Raves, Miss E. A. Fraser, B. Foster.

Important Correction.—Architectural Competition.

On page 5 of *The Practical Photographer*, No. 12, the closing date of the Architectural Competition is erroneously given as September 25th. This should read **October 25th**. Will intending competitors kindly note this correction.

Autumn Junior Salon: Entry Form.

The entry form will be found on page x. of our last issue, *The Practical Photographer*, No. 12, "Architecture."

Closing Date: November 5th, 1904.

Notice.

Will competitors please notice that the latest date for receiving prints for our competitions is that given on the coupon, and that we *cannot admit late arrivals?*

Notice—Queries.

In response to numerous requests from our correspondents we have pleasure to announce that we will do our best as far as space permits to reply to queries of a photographic nature. Will querists please (1) write plainly, (2) on one side of the paper, (3) as briefly as is consistent with clearness, and (4) give us the indulgence of their kind patience?

Pictures for Exhibitions.

To meet the convenience of those readers who are preparing prints for special dates (exhibitions, etc.), and cannot conveniently wait for printed criticism in our columns, we have arranged that readers may send us one, two or three prints with the usual Print Criticism Coupon and a fee of *one shilling for each print sent*. Within a week the prints, accompanied by a criticism, will be returned to the sender. The return postage must be prepaid in the usual way as in Rule 5. (See page v.) The fee must be sent with a letter and coupon to the Editor, and not enclosed with the prints. Each print must bear on the back the name and address of the sender.

Champion Class Competition.—Further Notice.

1. This competition is only open to those of our past competitors who shall before the end of this year have gained a place on our Roll of Honour as winners of our Plaques, Certificates, Prizes, Honourable Mention or Highly Commended.

2. Prints which have already gained awards will *not* be available. (*The maker of one good picture ought to be able to produce a second picture as good if not better than the first.*)

3. This competition will close **The Last Day of the Present Year**. (Therefore it is quite time to begin selecting negatives and making prints.)

4. The entry form will be issued in due course.

5. Special awards are in preparation.

Out of Print!

In answer to numerous correspondents we beg to say that No. 1 (Bromide Printing) and No. 2 (Bromide Enlarging) of the present series of *The Practical Photographer* have been out of print for some months. Also that our stock of the majority of the other back numbers is running very low, so that any one wishing to possess a complete set of the present Library Series should secure the needed numbers to fill up the gaps in his series without a moment's delay.

THE PRACTICAL PHOTOGRAPHER.



This Coupon Expires Oct. 31st, 1904.
THE PRACTICAL PHOTOGRAPHER. COUPON No. 27.

Prints for Criticism (or Queries).

RULES.

1. Write legibly, on one side of the paper only.
2. Put your name, address, and a number on the back of each print, and enclose this coupon.
3. Do not send more than three prints with one coupon.
4. State the *Month, Hour, Light, Plate Speed, Stop, Exposure, Developer, Printing and Toning* process employed.
5. If prints are to be returned, a stamped and addressed label or envelope *must* be sent **with the prints**.
6. The Editor reserves the right of reproducing any print sent in for criticism.
7. Prints should be addressed :—THE EDITOR OF *The Practical Photographer* (Print Criticism), 27, PATERNOSTER ROW, LONDON, E.C.



THE PRACTICAL PHOTOGRAPHER. COUPON No. 28.

Carbon Printing Competition.

Name

Address

WRITE LEGIBLY.

This Coupon Expires Nov. 25th, 1904.

Carbon Printing Competition.

A Silver and Bronze Plaque and Certificates will be placed at the disposal of the Judges.

1. Competitors may send one, two or three, but not more prints.
2. The picture may be of any subject (portrait, landscape, architecture, etc. but the print must be made by the Carbon (or Autotype) process.
3. Each print must bear the name and address of the sender, title, and also details of its production.
4. Marks will be given for technical and pictorial quality.
5. The Editor reserves the right to reproduce *any* prints sent in to this competition.
6. The Winning Prints will *not* be returned. Others will be returned, together with a brief criticism, if a stamped and addressed envelope or label be sent **with the prints**.
7. Additional marks will be given to a print illustrating any technical novelty in working the Carbon process.
8. Prints must reach us not later than **Nov. 25th, 1904**, addressed :—

The Editor of *The Practical Photographer*

(Carbon Competition),

27, Paternoster Row, London, E.C.

Advertisements.

THE

WELLINGTON BROMIDE

(Platino-Matt and Ordinary).

THE MOST POPULAR AND FINEST
QUALITY MEDIUM FOR CONTACT AND

ENLARGEMENTS

GRADES: (Platino-Matt) Smooth, Rough, Cream Crayon,
Special Thick and Xtra Rough.
(Ordinary) Smooth and Rough.

LATEST FULL PRICE LIST ON APPLICATION.

MANUFACTURERS :

Wellington & Ward, ELSTREE, HERTS.

vi.

Kindly mention "The Practical Photographer."



J. Craig Annan



THE PRACTICAL PHOTOGRAPHER.

Library Series.

No. 13.

The Pictorial Work of J. Craig Annan.

By THE EDITOR.



R. J. CRAIG ANNAN has an advantage over most of us, for he has been enveloped in a photographic atmosphere or environment from his youthful days. Indeed it would be no surprise to hear him say that he could not remember the beginning of his photographic experiences.

This comprehensive statement here set forth in cold print may prompt the reader to picture our artist as a grey-bearded octogenarian. But a glance at the man himself would quickly dispel this mistake, and reveal one who is as yet hardly within sight of the meridian of life, with a heart and mind elastic and buoyant in harmony with his years. And yet it would not be easy to name any other pictorial photographer whose sound and broad judgment carries such wide-spread consideration and confidence.

A townsman born, he, like so many others, has the keenest appreciation of country life and attractions. The rolling breakers on the shore, the gurgling burn or swishing freshet, make music for him, which he prefers to the most surprising orchestrations of Wagner or intricate fugues of Bach. Some of his happiest moments are spent

THE PRACTICAL PHOTOGRAPHER.

on the heather-clad banks of the mountain stream with rod in hand in search of a lively trout or hungry salmon. He is a gardener too, but instead of twisting and turning branches here and there, or bedding out plants to resemble gaudy carpets, he prefers to let Nature know her own business and do it in her own way, merely lending now and again a guiding hand to make large pictures in colour patches, relying on breadth of general effect rather than isolated phenomena of size, shape, or colour.

Although he does not profess to be either a keen admirer or critic of poetic literature *en masse*, yet Tennyson is a favourite, and we can see for ourselves an under-current of poetic treatment running through the pictures herewith reproduced.

The graphic arts generally have always engaged his enthusiastic sympathy. If a preference must be assigned, it would probably fall in the direction of mezzotint and etching rather than line engraving.

One cannot correctly label Mr. Annan as a portraitist or landscapist or any other *ist*, because it is all one to him what the subject is provided it possesses pictorial "quality." Thus we do not find him especially affecting certain lightings, poses, shapes, etc. His pictures are not selected to fit certain preconceived regulations, but are observed and selected because they individually have attractions. The weak point in photography, in his opinion, is its great facility whereby passable or commonplace results may be obtained, but the trustworthy "drawing" which it is capable of yielding when intelligently employed is a counter-balancing strong point.

On the whole he is disposed to regard the outlook of photography as an art process as decidedly promising. One need hardly say that, having commenced photography in his schoolboy days, he has become an expert craftsman in all the usual processes; but by choice he works in carbon, platinum or photogravure.

He holds no exclusive views on the question of "mount or no mount," and in his own practice employs a wide-margin mount or close framing just as the individual print is best served.

THE PICTORIAL WORK OF J. CRAIG ANNAN.

Among the great artists of the past who especially appeal to him may be mentioned Rembrandt, Hals, Velasquez, and especially Holbein.

The series of pictures herewith reproduced have an especial interest for us by reason of the fact that the originals have at one time or another been seen on the walls of the Photographic Salon. From this fact we may rightly infer that Mr. Annan is a consistent supporter of this institution, where his sound judgment carries great weight.

Following previous custom, we add a few jottings on the pictures in the chronological order of their exhibition ranging between the years 1893—1901.

A Utrecht Pastoral.—This picture reveals the strong sympathy of our artist for the Dutch school, both as regards subject and treatment. The band of quiet foreground, which most photographers would trim away as useless, is quite wisely retained. Its presence greatly adds to the feeling or suggestion of space and scale. The bold and large treatment of the clouded sky space must be noted. This and the two next-mentioned prints are from a series of studies made in Holland during 1892, and exemplify our artist's first serious landscape work.

Fishers' Wives is another exceptional instance "proving" the rule as regards the retention of a stretch of quiet foreground. The grouping of the figures, baskets, and craft at once engages our attention. Our small reproduction of a much larger original largely fails in conveying the delightful suggestion of atmosphere, cloud and sky. This and the last instance should be carefully studied as valuable lessons in the "placing" of the chief figure.

Reflections : Amsterdam.—Here we have an instance of the choice of subject which would not be likely to be seen at all by the ordinary (*i.e.*, unobservant) camera man. And it will be noticed that the part which the ordinary individual would trim away has been retained, while the part most likely to be retained has been omitted. These facts in some degree contribute to its interest and freshness, or what was freshness in '93; for alas! it is one of the pictures which since then has been "flattered" by countless imitators—of course with but very indifferent success. We are disposed to

THE PRACTICAL PHOTOGRAPHER.

complain of our artist here having retained even yet too much subject. The many broken reflections are inclined to confuse rather than please the eye, although at the same time they abound with interesting phases of light and shade effects.

Miss Burnet—a portrait taken in an ordinary room with low windows and the light immediately behind the camera. In brief, the artist has flown in the face of traditional teaching. But the splendid result more than justifies such rank heresy. We here have an example—as interesting as it is exceptional—of a photograph which at the time of its exhibition (1894) instantly compelled admiration and is still as widely esteemed to-day. The reason being probably its natural and unconventional character. Everyone at once says, “What a charming *picture!* I am sure it must be a good *likeness.*” We shall not fail to note the boldness in putting the title just where it is—a craftsman’s touch which perhaps owes some of its success to its daring nature.

The Church and the World.—It yet remains an open question as to whether photography is likely to lend itself successfully to the making of religious pictures; and for the present we may likewise suspend our judgment as regards the allegory. But at any rate this photograph may be quoted as one of the most successful as well as original efforts in that direction. Personally we do not at present regard it as an unqualified success; nor do we for a moment admit it as a failure. This “halting between two opinions” might perhaps be better described as waiting for a somewhat crisper, clearer apprehension of the artist’s intention. The title is capable of so many variations of interpretation.

In a Garden Fair “goes home,” as the painters say. The summer sun, the joyous spring-time of girlhood, the calm quiet of so fair a garden, at once strike musical notes in one harmonious cord. The peep through the open garden door suggests cool and welcome shade by force of contrast. This is another picture which, though much imitated, yet stands alone—as, indeed, every fine piece of strongly individualistic art-work always must do. Judged



Fig. 2.

А Улреліт Пасторал.

J. Craig Annan.

α β ε ε β η ι ς β



α η δ α β ε ω ι δ

Fig. 3.

J. Craig Annan.

from the standpoint of the conventional it exemplifies various infractions of tradition, but it is "success to the brave," and this picture owes no little of its charm to its boldness and freedom of treatment.

Summer.—One might almost imagine that a few steps through the open door just shown might bring us to this garden bench, where the sparkling and warm summer sunshine is playing around these two charming ladies. The suggestion of summer sunshine is quite delightful. The observant student will not fail to note the unconscious expressions, natural pose of figures and broad effective distribution of light and shade.

Professor Young.—Another fine portrait, which, like that of Miss Burnet, makes one feel sure that it is a good likeness as well. The treatment of the hands, fur, beard, etc., are eloquent and valuable lessons. Indeed, one cannot look at any of the various pictures of this series without recognising the work not only of a fine craftsman, but also of one who has an instinctive appreciation of light and shade.

One of the many useful lessons we may glean from Mr. Annan's work is the need for the photographer always to keep his eyes open, to throw prejudice to the winds, to be prepared to see interest and beauty at any moment and anywhere, and to bear in mind that it is arrangement of light and shade that makes a good picture.

We all owe deep and very grateful thanks to Mr. Annan for having shown us these valuable lessons in such a masterly and skilful manner, and beg him not to measure our appreciation by our halting remarks.

NOTE.—It will be a matter of general interest to know that the blocks from which the accompanying reproductions of Mr. Annan's pictures were printed, have been made under his personal supervision. Our readers will join with us in offering him our very hearty thanks for this greatly appreciated mark of his sympathetic help.



Practical Introduction to Carbon Printing.

By HENRY W. BENNETT, F.R.P.S.



IN considering the carbon process, it has not been thought desirable to institute any comparisons between this and other methods of photographic printing. A simple description of carbon printing with full working details, is the scope of the present article. Its object is to enable those unacquainted with the process to work successfully. In addition, the character and special features are described so as to give, not merely instruction in working, but also definite information regarding the results obtainable and the manner in which they may differ from those produced by other methods.

Colours and Papers.

Carbon printing is unique in two respects, *viz.*:— the wide range of colours in which prints may be produced, and the endless variety of papers of the worker's own choice that may form the support for the image. With regard to the first, paper prepared for carbon printing is obtainable commercially in many shades of colour, including black, brown, sepia, red chalk, green, blue, carmine, etc., with many intermediate tints. The final colour of the print is determined in the preparation of this paper. The gelatine film that it bears has to be transferred to another paper after printing, and this final support of the print may be any drawing or other paper. The film is so thin that it does not obscure the grain or character of the papers used.

Whether the print is over or under-exposed and the after-treatment modified accordingly, it still remains exactly the same shade of colour as if exposed correctly, *i.e.*, the colour selected when commencing to print. To those who work seriously carbon offers an unrivalled choice of colours and effects, or combinations of colour of image and tone and texture of support.

PRACTICAL INTRODUCTION TO CARBON PRINTING.

Simplicity. To the uninitiated the carbon process appears difficult, but the apparent difficulty arises from the fact that the method of working is essentially *different* from that of other printing processes, and new terms are used to describe the operations. The working is strange, not difficult, and a brief acquaintance dispels any illusion on this point. As soon as the worker becomes familiar with the manipulation it is recognised that the production of a carbon print is simple and certain.

Apparatus. Many are deterred from trying carbon printing by the impression that a considerable amount of special apparatus is necessary. This is entirely erroneous. With the exception of a thermometer and an actinometer, there is nothing required beyond those articles that any ordinary worker's outfit would comprise. For developing, a deep dish or small bath may be borrowed from the domestic stores.

System. It is, however, very necessary to state clearly that systematic work is essential to success. The absence of any visible image in printing, and the fact that errors in working cannot be seen until rectification is impossible, render care and system in working absolutely imperative. Although this fact is emphasised, it should be added that the work throughout is very simple in character, and no skill is required beyond that necessary for the production of a good negative. With reasonable care success is assured.

General Outline. To give a brief general outline first will enable the reader to follow the more detailed descriptions of the various operations better. It will also enable him to understand more easily the reason for some of the details given.

The basis of the carbon process is the solubility of gelatine. This substance in its normal condition will absorb cold water readily, but will not melt. In hot water it dissolves easily. If gelatine is treated with potassium bichromate, or similar salts of chromium, exposure to light so hardens it that hot water is no longer capable of dissolving it.

THE PRACTICAL PHOTOGRAPHER.

Without exposure to light it retains its soluble character for a considerable time.

For carbon printing a film of gelatine impregnated with potassium bichromate is spread upon paper, and after exposure to light under a negative, those parts of the film that remain soluble are washed away by simple treatment with hot water. As the degree of insolubility is directly proportionate to the extent of the light action, more of the film is dissolved away to form the half-tones than in the shadow details, and still more in the lightest parts of the subject.

In preparing the film coloured pigments are incorporated with the gelatine, the colour selected determining the exact colour of the prints. In dissolving away the soluble portions of the film after printing, the colour that they contain is washed away at the same time without discolouring or staining the paper support. This leaves only the colour and gelatine where the latter has been hardened by the exposure in the printing frame, the result being a picture in coloured gelatine.

Permanency. The prints should be absolutely permanent. Their durability is determined solely by the stability of the paper or other substance used for supporting the image. The gelatine film, after the hardening with potassium bichromate, becomes one of the most stable substances, and so long as permanent pigments are used in the preparation of the film, fading or change is physically impossible. The conditions are radically different from those existing in silver prints in gelatine. In the latter it is the unstable silver salt that is the cause of fading and loss of quality, not the gelatine. In carbon prints both the colour and the insoluble gelatine are thoroughly durable.

Development. It is necessary that a carbon print should be developed from the back of the film, *i.e.*, the surface in contact with the supporting paper. Practically the whole of the face of the film becomes insoluble during printing, although in the light tones this insolubility extends to a very small fraction of the thickness of the film.

Fisheries
Wives



Fig. 4.

J. Craig Annan.



Fig. 5.

J. Craig Annan.

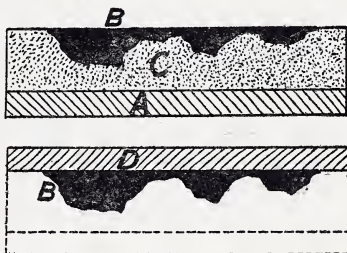
IN A GARDEN FAIR.

PRACTICAL INTRODUCTION TO CARBON PRINTING.

It is, however, sufficient to render development from the face impracticable. If it were attempted the soluble gelatine, in dissolving away, would bring the whole of the insoluble parts of the film, *i.e.*, the image, away with it. By developing the film from the back, the soluble part is exposed to the action of the hot water bath first, the insoluble remaining in contact with the paper support.

Transfer. In order to allow the film to be developed from the back, it is necessary that it should be "transferred" from the paper on which it is printed to a new support. This is an exceedingly simple operation; it need not cause the inexperienced any uneasiness nor fear of failure.

The accompanying sketch will enable the descriptions given in the two preceding paragraphs to be readily understood. It is an enlarged section of a carbon print, before and after development.



A is the original paper support; B the portions of the film rendered insoluble by the action of light; C the soluble portions; D the new paper support.

Reversal of Image.

From this diagram it will be apparent that in thus transferring the film the image has become reversed, *i.e.*, the left side has been changed to the right. This is the only objection to the carbon process. There is, however, a simple method of restoring the picture to its correct position when necessary. For many subjects it is unimportant, but this reversal is inadmissible in architectural work, in many figure subjects, especially where the actions would suggest "left handedness," in some portraits, etc.

In describing the process it appears very clumsy, and quite incapable of giving even passable results. In practice it is the most delicate and flexible of printing methods. It is capable of giving the finest gradation, and registering every shade and tone

THE PRACTICAL PHOTOGRAPHER.

existing in the negative. Both in force and in gradation it is equal to silver printing-out-paper, while in flexibility or adaptability to varied tastes and requirements, it is practically unrivalled.

The Negative. In order to obtain good results in carbon printing, a rich vigorous negative is essential. The degree of contrast must be distinctly greater than is desirable for ordinary silver printing. This contrast, however, must be obtained without harshness. Softness of gradation is not inconsistent with vigour and brilliancy. A negative suitable for P.O.P. will only yield a flat weak print in carbon.

Safe-Edge. The negative must be provided with a narrow opaque margin, technically called a "safe-edge." This may be a narrow strip of non-actinic paper attached either in the film or glass side, or a narrow edging of opaque water colour on the film, or of black varnish on the glass. It should be about an eighth of an inch wide in small sizes and rather wider in larger negatives. An alternative plan is to prepare a piece of plain glass with an edging of opaque paper and place it outside the negative in the printing frame. A few prepared glasses will answer for many negatives. The object of the safe-edge is to ensure that the extreme margins of the sensitive paper shall be unaffected by light, or remain white. This is essential for successful development. In printing, the sensitive paper must be larger than the unobstructed part of the negative, but it must not project beyond the safe-edge. The latter must cover the margins of the prints on all sides.

Carbon "Tissue." Paper prepared for carbon printing is called "carbon tissue." It may be purchased either sensitive or insensitive. The inexperienced should obtain the tissue required for his earlier work sensitive; he can then ensure that his materials are in good condition and capable of yielding fine results. Then failure cannot be attributed to imperfect tissue.

PRACTICAL INTRODUCTION TO CARBON PRINTING.

Keeping Qualities and Storage. Sensitive carbon tissue will not keep in good condition for more than about seven days without special precautions. If it can be used within a few days the best method of storing is under moderate pressure in a printing frame, wrapped in opaque paper.

Carbon tissue is most unpromising material in appearance. It most resembles leather cloth, the dull surface of the gelatine film showing the colour and depth of the darkest tone possible. The dark surface is that to be placed in contact with the negative. In ordinary printing processes a dark image is gradually built up on white paper; in carbon a dark paper or film is taken, and those parts not required to form the image washed away until the white paper basis is seen.

Printing. Usually little or no visible image is produced by exposure to light. A method therefore has to be adopted for timing the exposure in the printing frame. A plan that may be adopted for preliminary trials is to select a negative similar in clearness of shadows and density of light tones to that from which the carbon is required. When commencing to expose the carbon tissue, put out the second negative to print with a piece of ordinary P.O.P. When the latter is from half to two-thirds printed, judging from the light tones, the frame containing the carbon print may be taken in. At the best this method is uncertain and unsatisfactory.

Printing by Actinometer. For ordinary work, printing by actinometer is the only satisfactory method. With a little practice it is so simple that it is soon found preferable to other methods. The ease of examining a small actinometer from time to time as a guide to any number of frames (that require no examination to determine when *they* are finished) more than compensates for the slight trouble involved in becoming accustomed to its use.

Actinometers. There are several forms of actinometers for gauging the depth of prints, silver paper being used for the actinometer printing. Some print through a series of squares

THE PRACTICAL PHOTOGRAPHER.

of increasing density, the thinnest, or number one, printing in two or three minutes, while the strongest, which may be twenty or twenty-five steps from the first, may require an hour or more. In using such an instrument, the highest square visible, (*i.e.*, which shows a faint image only when the carbon print is correctly exposed,) is the number to be registered for printing that negative. When prints are wanted, the tissue is exposed until the silver paper in the actinometer just shows the required number. Any number of frames may be put out to print by means of one actinometer, provided that all commence at the same time, each being taken in as its own number becomes visible on the actinometer print.

The second type consists of a single square or tint that is printed many times in succession to gauge the duration of printing. In my own practice the latter plan is found preferable, though my method of using it is somewhat different from that usually adopted. An actinometer is constructed that prints a faint image of its standard square or tint in two or three minutes in good spring or early summer light. In addition to the standard tint there are two or three squares of slightly less density which assist the worker in determining when the standard tint is the correct depth.

When printing, the actinometer is put out with the frames, and the time that is required to print the standard tint carefully noted. If it should be three or four minutes and the light appears uniform, it is left for about a quarter of an hour and the light tested again, and so on during the whole time that printing is in progress. For example, if a certain negative requires ten tints for its correct exposure, and the actinometer shows that the light is uniform and prints the standard tint in four minutes, forty minutes will be the correct time to print. If the light should vary during printing the exposure can be lengthened or shortened accordingly. By keeping a slip of paper to note the time at which each print is commenced, and the number of tints, or multiples of the time of the standard tint of the actinometer, that it requires, any



Fig. 6.

J. Craig Annan,

Summer.

PRACTICAL INTRODUCTION TO CARBON PRINTING.

number of frames may be kept working without any necessity for commencing all at the same time.

Shielding, etc. By keeping a record of any shielding or masking that may be required, and the proportion that it should bear to the total time of printing, this type of actinometer enables the worker to apply such methods of modifying his prints with as much certainty as in silver printing.

Making an Actinometer.

Either type of actinometer may be made in a few minutes, the only materials required being a quarter plate printing frame, a piece of plain glass to fit it, some thin white tissue paper, and some opaque paper. For the first type, five or six thicknesses of tissue paper should cover the glass, and on these other pieces should be placed, so cut as to form a series of squares each consisting of one thickness more than those forming the preceding. In the second type, about seven thicknesses of tissue paper should form the first square, one, two and three extra thicknesses being added to form successive squares, the last being the standard tint, the three thinner being guides or pilots as previously described. The squares should be surrounded in either case by opaque paper, narrow strips of which should also separate them. If the squares are surrounded by pure white when printed, it is far easier to gauge their depth correctly. Considerable attention is given to the subject of the actinometer, as the method here advocated has been found so much better than using the commercial instruments in my own practice, as to fully warrant the time spent in constructing one. For the occasional worker, it is particularly necessary to use that type of actinometer that is most simple and certain in application.

Silver Paper. For printing in the actinometer, glossy gelatine-chloride paper—the ordinary P.O.P.—should be used. White or mauve show the feeble image most plainly. This paper does not vary in rapidity with keeping like albumenized and some other kinds of silver paper. It should not be used if discoloured from age or

THE PRACTICAL PHOTOGRAPHER.

imperfect storage, on account of the difficulty in determining the correct depth of printing. It is very important that the same brand of silver paper should always be used for the actinometer, as the various makers' papers differ considerably in rapidity.

Speed of Carbon Tissue. In order to render correct exposure in carbon printing easily attainable I have made a number of experiments to determine the relation between commercial sensitive carbon tissue and silver paper. Ilford P.O.P. has been taken as the basis for comparison, the relative exposure necessary for carbon being:—

Ilford P.O.P.	10
Autotype, Black tissue	5
Autotype, Brown or red	6
Barnet, Black.....	7½
Barnet, Brown or red.....	9

Brown and black tissues are nominally equal in rapidity, but in practice it is desirable to give a rather longer exposure to a brown or red print to make it appear as dark as a black one.

Test Prints. This relative exposure table will enable any worker to expose a first print from any negative correctly. A trial print should be made on the same silver paper used for the actinometer, the printing being carefully gauged by the actinometer, and the number of tints ascertained that correspond with the correct depth. This test print should not be dark enough for toning, but the light details should appear exactly as required in the carbon print. The dark tones may be disregarded. The correct proportion of the number of tints required to produce this effect, obtained from the preceding table, will give a correctly exposed carbon print.

Storage of Prints. Whenever possible, carbon prints should be developed the same day that they are printed. If not developed at once they should be stored in a calcium tube, in the same way as platinotype prints are kept. In such a tube they may be kept for several days, but they become very hard, brittle, and liable to crack or break unless handled with great care. If it is necessary to keep them so long, they should

PRACTICAL INTRODUCTION TO CARBON PRINTING.

be taken from the tube and put in a dark place, where they can absorb moisture from the air, for about an hour before they are required for development. If a calcium tube is not available, they should be placed under pressure in a printing frame until required.

Continuating Action.

A peculiar feature of the carbon process is that a print when taken from the frame continues to gain strength, though very slowly, even if kept in absolute darkness. This "continuating" action is entirely stopped by thoroughly drying the print, as in a calcium tube; and it is very much retarded by storing the print under pressure so as to prevent the air having access to its surface. This continuing action is not under control, as it varies considerably according to the degree of humidity of the atmosphere.

Single Transfer Paper.

When purchasing sensitive carbon tissue, the worker should also obtain some "Single transfer paper." The kind known as "Thin single transfer" is the easiest to use. It should be a little larger in each direction than the tissue, but in buying cut sizes the necessary allowance is made by the manufacturers. Both tissue and transfer papers are sold in packets of one dozen pieces in small sizes, and in half-dozens in the larger sizes.

Single Transfer. The term "Single transfer" is used to indicate the method of working already described, the film or print being transferred from its original paper support to a new support consisting of the single transfer paper.

Transferring the Print.

When ready for developing a piece of transfer paper for each print should be soaked in cold water for about five minutes. The glossy side is the face, and to prevent mistakes in working it is a good plan to mark the back with a soft pencil. A print should be taken and immersed in cold water, face downwards, one of the pieces of transfer paper having been previously placed in the same dish of water, face upwards. The print will show a tendency to curl, face inwards, this tendency

THE PRACTICAL PHOTOGRAPHER.

varying with its dryness, the age of the tissue, etc. If it should curl decidedly, it is the best guide to the time of soaking. It should be kept entirely beneath the surface of the water. After a few seconds it will commence to uncurl or straighten out, and as soon as this uncurling becomes pronounced, and before the print becomes flat, it should be brought into contact with the transfer paper under water, the two lifted out, face to face, placed on the squeegeeing board and firmly squeegeed together.

Squeegeeing Board. The squeegeeing board may be a piece of slate or stout glass for small sizes ; it is not necessary that it should be much larger than the prints. A flat squeegee is necessary.

Number of Prints. Any number of prints may be transferred for development together, but each must be treated separately, and only put in the cold water for the few seconds necessary for it to become sufficiently limp for squeegeeing to the transfer paper. If allowed to soak longer it will refuse to adhere. A dozen prints may be soaked and squeegeed into contact in ten minutes.

Light in Work-room. Until the prints are placed in water, they should be handled in very subdued daylight or in gaslight only, as the tissue is more sensitive than silver paper. When they are wetted, however, they lose their sensitiveness to light, and all the remaining operations may be carried out in full daylight. This is a great advantage, as it allows the extent to which development should be carried to be judged very accurately.

Partial Drying. After squeegeeing to the transfer paper, the prints must be partially dried before development. The best method is to place them between blotting paper, under moderate pressure; in a printing frame, for example. The prints should be separated from each other by one or two thicknesses of blotting paper. They should be allowed to dry for about fifteen minutes, and not in any case longer than twenty.

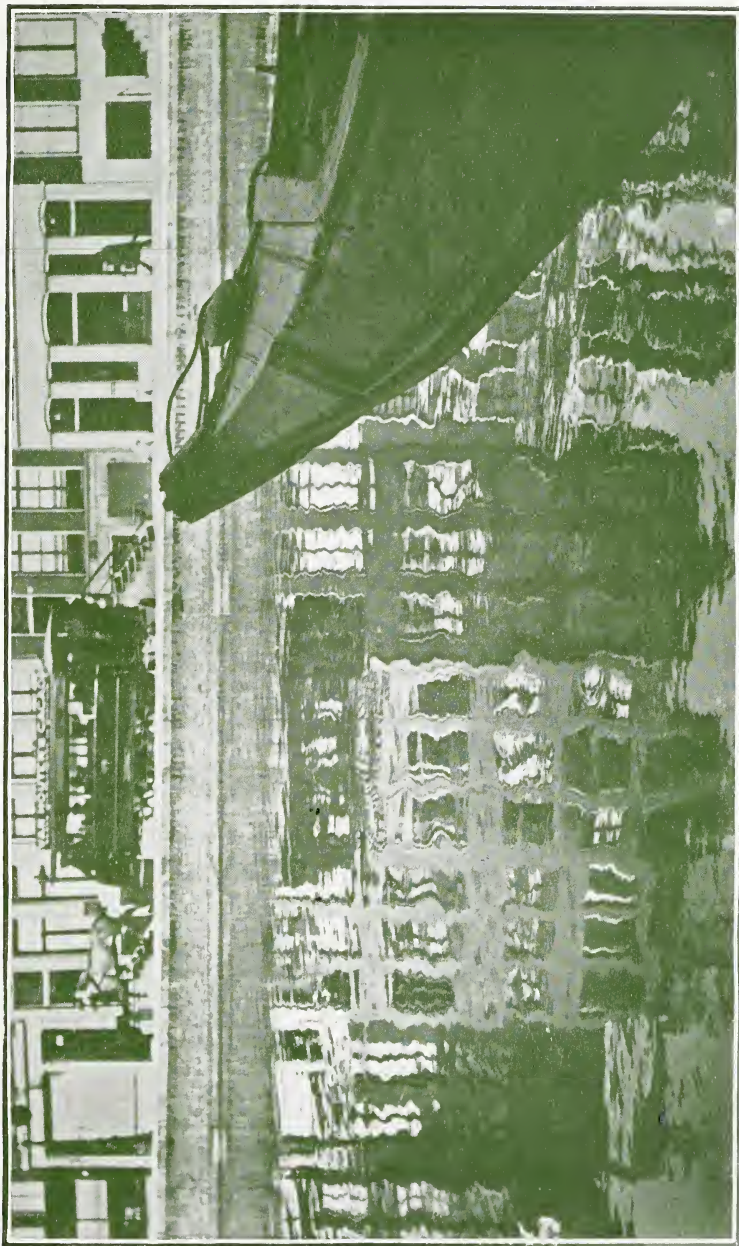
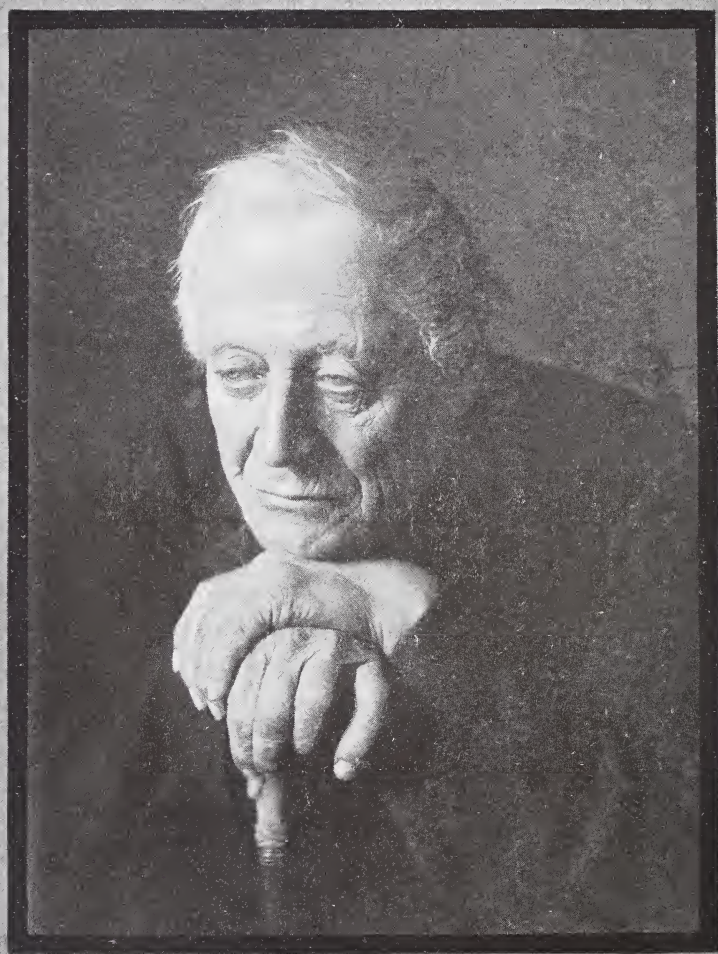


Fig. 7.

REFLECTIONS. AMSTERDAM.

J. Craig Annan.



PRACTICAL INTRODUCTION TO CARBON PRINTING.

Preliminary Cold Bath. After fifteen minutes' drying in blotting paper, the prints should be placed in a dish of cold water. This is a radical departure from ordinary practice, but, to the small worker particularly, it will render carbon printing far more pleasant and easy. Long drying will make the prints partially insoluble, and render development difficult. The cold water will not in any way injure them, but development may proceed slowly and carefully. Each print can be taken as required without there being any risk of loss of quality if a long time should elapse before the last one is commenced.

Developing Bath. For development, a deep dish or tank is required. In working small sizes, any domestic bowl will answer if it will allow a depth of five or six inches of water. It should be about twice as large as the prints to facilitate working.

Developer. The developer is simply hot water. When ready for working, the bath should be filled with water at a temperature of 105°F. to 110°F. A large supply of hot water is not necessary. A small kettle of boiling water should be in readiness from which we may take a little water occasionally as the temperature of the developing bath falls. It is not necessary to raise it until it falls below 100 degrees, excepting when a fresh print is being commenced or development appears too slow.

Renewal of water not necessary. Nor is it necessary to renew the developing bath. However dirty the water may appear from the colour and gelatine dissolved from the prints, they will still emerge bright and clean. Prints of various colours may be developed together in one bath without any staining or loss of quality.

Development. A print with the transfer paper attached is taken from the cold water and submerged in the developing tank, the original paper support being uppermost. After about thirty seconds, the coloured gelatine will be seen oozing out from the edges of the paper. When this happens, a corner of the backing paper (*i.e.*, the original support), should be lifted carefully, and if

THE PRACTICAL PHOTOGRAPHER.

it lifts easily, it should without stopping be gently and steadily pulled away from the transfer paper. The print must be kept below the surface of the water during this operation. If it should be difficult to remove the backing paper, it should be left soaking for a few seconds longer, and a fresh attempt made from a different corner.

The print after the removal of the backing paper looks most unpromising. It is a mass of semi-liquid jelly supported by the transfer paper and firmly attached to it. By keeping it below the surface and causing the water to flow gently over it, the softest or most soluble parts of the gelatine will rapidly commence to wash away and the lightest parts of the picture appear somewhat indistinctly. By continuing the treatment, and lifting the print out for examination occasionally, and allowing the dissolved gelatine and water to drain off, the picture will steadily gain in distinctness; and in about four or five minutes it should be fully developed. An alternative plan is to leave the print lying in the tank face downwards, when it will develop automatically in from five to seven minutes.

Stopping Development.

When the print is sufficiently developed, it should be placed in a dish of cold water face downwards to rinse off any dirty water and gelatine that may loosely adhere. If the development has been short, two or three changes of water may be necessary. The print must appear bright and clean before leaving the washing water.

Alum Bath.

It should then be placed in an alum bath (alum one ounce to a pint of water) for five minutes. After the alum bath washing in three or four changes of water is necessary, and then the prints should be hung up to dry.

On no account must the surface of the print be touched during the operation of development or until after drying.

Object of Safe Edge.

The object of the safe edge in securing a margin of perfectly soluble gelatine is seen in the description of development. By means of a perfectly soluble margin the removal of the backing

PRACTICAL INTRODUCTION TO CARBON PRINTING.

paper is easy. Although the whole of the back of the film is partially soluble, this solubility is so slight where there is a strong shadow that if such a shadow occurred at the edge of a print with no safe edge the backing paper would lift the film at that point in being removed, and probably the greater part of the picture as well.

Treatment of Under-printing. Considerable power of control exists in development. Prints that develop too quickly, and show by their rapidly becoming very light in appearance that they have been slightly under-printed, may be made to yield results equal to those correctly exposed by being placed for a few minutes in cold water, and then development completed in slightly warm water only. But if the under-exposure has been excessive, saving the print is impossible. Figs. 14 and 15.

Treatment of Over-printing. Moderate over-printing may be compensated for by longer development in the normal bath. If the print should not become sufficiently light by this treatment, the temperature of the developing water may be raised to 120 or 125 degrees, and development continued until the print is sufficiently reduced. Instead of raising the temperature of the water, a little sodium carbonate or washing soda may be added; a piece as large as a walnut is sufficient for a gallon of water. In extreme cases the temperature may be raised and the soda added as well; but if these remedies should both become necessary, the print is in most cases a hopeless failure. With reasonable care prints should not err beyond the power of control conferred by longer or shorter treatment in the normal solution.

Control in Development. If one part is relatively too dark, hotter water may be poured on that part from a jug; or if portions are developing too rapidly, indicating that they will be too pale in the finished print if the remainder is fully developed, the action of the hot water may be stopped by immersing the print in cold water for a few minutes, and then local development resorted to by pouring warm water from the developing tank on those parts that require it. Figs. 12 and 13.

THE PRACTICAL PHOTOGRAPHER.

Defects in Development. If the surface is not touched during development, the only defect that is liable to occur is blistering or frilling. These are two forms of the same defect. Blisters may form in any part, while at the margins the film may leave its support in a similar manner to the frilling in a negative. The most frequent causes are :—

First: air bubbles between the exposed print and the transfer paper when squeegeeing. The best method of preventing this, is bringing the two together under water, as previously described, though this is not practicable in very large sizes.

Second: insufficient care in squeegeeing. A good smooth surface must form the support for the paper during this operation, and care must be exercised that the whole of the print is covered with firm strokes in each direction.

Third: leaving the exposed tissue soaking too long before squeegeeing to the transfer paper. It should be brought into contact as soon as sufficiently limp to allow squeegeeing to be performed satisfactorily. If left too long it has a tendency to peel off, and securing adhesion is very difficult.

Fourth: removing the backing paper too soon after placing the print in the developing tank. If the soluble portion of the gelatine is sufficiently softened, the backing paper will leave the film easily, as the least resistance will be in the softened portion at the back of the film. If not, there is a tendency to pull the film away in places. If two or more of these causes are combined, the tendency to blistering is greater. With reasonable care and attention to details, blisters or similar defects should not occur. Prolonged or forced development increases the risk of such defects, as the hot water may, in time, penetrate the paper support.

Single Transfer Paper. Single transfer paper is a fine paper prepared with a coating of insoluble gelatine. Other preparations may be used instead of gelatine, the object being to prepare a support impervious to water, so that the gelatine film forming the print cannot be



Fig. 9.

J. Craig Annan.

Professor Young.

PRACTICAL INTRODUCTION TO CARBON PRINTING.

attacked by water from the side in contact with the transfer paper. If it is, it leaves the support and blisters form.

Special Notes for Rough Papers. The worker has been advised to commence with smooth ordinary single transfer, as the use of the rougher drawing or etching papers involves greater risk of failure to the uninitiated. In the latter, the gelatine coating is much thinner, but with a little practice no difficulty is experienced in their working. Before squeegeeing the print into contact the paper should be soaked in water for at least twenty minutes. If very rough and thick, an hour's immersion is better. More force must be used in squeegeeing so that the tissue is forced into good contact with the paper throughout. As the gelatine coating is thinner, there is greater risk of the water penetrating it and causing blisters if development is too prolonged.

Character of Prints. The difference between prints on these papers and the smooth single transfer with its thicker gelatine coating is that in each case the character of the paper is preserved in the prints. With the ordinary paper the surface of the print is semi-glossy throughout, and quite smooth. With drawing papers there is no gloss excepting in the extreme shadows, where it is most wanted and imparts depth and transparency; and the grain or texture of the paper is retained in the finished print. Some of these papers are tinted, the colour adding warmth to the print. With some tissues, notably deep brown or warm black, a toned support increases the richness of effect considerably.

Alum Bath for Rough Paper. When thick papers are used the prints must be left in the alum bath much longer than the time previously given. The object of the alum is to remove any yellow stain left by the bichromate. In most cases ten or twelve minutes should be sufficient, but the prints should remain in the bath until all traces of yellowness have disappeared from both back and face. The more prolonged the development, the more bichromate is removed from the paper during that operation.

THE PRACTICAL PHOTOGRAPHER.

Double Transfer. For those subjects in which the reversal of left and right is inadmissible, "double transfer" is necessary. This involves an extra operation, the re-transfer of the print after development; but there is no special difficulty. The process is simple.

Temporary Support. The print must be developed on a "temporary support" instead of the single transfer paper. These supports are of two kinds—flexible paper, and rigid, ground opal glass. Both are readily obtainable from those firms who supply carbon tissue and materials. The paper supports are much easier to use and preferable in every way. They consist of thick paper prepared with a heavy coating of gelatine and lac, quite waterproof, and possessing a fine and perfectly smooth surface. The smooth semi-glossy surface is the working face.

Waxing the Support. The temporary support requires to be waxed before using. A solution for waxing should be purchased. A small pool is poured on to the centre of the support and rapidly rubbed over its entire surface with a piece of fluffless fabric, the excess of solution being rubbed off with a second piece. The surface should be left decidedly moist with solution, and as evenly moist as possible. The solution will evaporate, leaving a very thin coating of wax on the support. The supports must be waxed at least two hours before required, so that the turpentine and other solvents of the wax may thoroughly evaporate. They should be hung up freely exposed to the air. After waxing they may be kept almost indefinitely if they are preserved from dust, etc., after the evaporation of the solvents.

Development. The operation of development is exactly the same as when using single transfer paper. The temporary supports require soaking in water for at least five minutes before the exposed prints are squeegeed to them.

Alum Bath. A longer immersion in the alum bath is necessary. The temporary support is much more liable to bichromate staining. The developing bath does not remove it so readily as with the softer papers.

Drying After Development. After washing from the alum solution, the prints should be dried before the second transfer is attempted. With great care it may be done before drying, but there is serious risk of injuring the print. After drying it will bear much rougher treatment.

Final Support. Paper for the second transfer is called "final support." It is prepared with a moderately thick coating of soft gelatine. It may be obtained commercially, smooth, and with a fine grain, both white and toned. For the latter the flexible support must be used in developing the print; for the smooth paper, either the flexible paper or opal supports may be used. The final support should be cut slightly larger than the print, but smaller than the temporary support.

The Second Transfer. The prints should be transferred to their final support as soon as practicable after drying. They should not be dried rapidly, as this induces a tendency to leave the temporary support spontaneously. If not to be transferred at once they should be kept in a cool place. A piece of final support for each print to be transferred should be soaked in cold water for at least half an hour before transferring. The temporary supports bearing the prints should be immersed in cold water until thoroughly limp. A print is taken from the water and laid face upwards on the squeegeeing board, and the corresponding piece of final support is placed in warm water, temperature 90 to 95 degrees, until the gelatine coating is soft and yielding. This can be ascertained by pressing the finger tip on one corner. It should then be placed face downwards on the print and firmly squeegeed into contact. When thoroughly dry the print may be stripped off by gently lifting from one corner and pulling it away from the temporary support. No further treatment is necessary. If the operation of transferring has been properly performed, the print will leave the temporary support easily. It will be firmly and permanently attached to the final support.

THE PRACTICAL PHOTOGRAPHER.

Blisters. Blistering and frilling are more liable to occur in development if the support has been insufficiently waxed; it appears to hold the film less tenaciously.

Temporary Support. The temporary support may be used many times in succession. It should be carefully re-waxed for every print. When it shows signs of wearing and fails to work satisfactorily, it should be discarded and a fresh piece substituted.

Defects in Double Transfer. If the image fails to leave the temporary support satisfactorily, the cause may be either in the preparation of the temporary support or in the second transfer; or it may be due to a combination of the two causes. If there is insufficient waxing solution left on the temporary support it will hold the gelatine film too tenaciously, and the lighter parts may break away from the final support and remain in patches. If the final support is allowed to remain in warm water too long the soft gelatine coating will be partially dissolved and fail to hold the image. If the coating is not sufficiently softened bright semi-transparent lines or patches appear in places, especially round a mass of dark work that stands against a light tone. The conditions necessary for successful transfer are that the paper support shall bear a film of gelatine sufficiently soft and yielding to allow the image on the temporary support to be well imbedded, and adhere thoroughly at every point. Very little practice will enable the carbon worker to determine the degree of softness necessary easily; the gelatine coating should be as soft as possible without any tendency to dissolve.

Cleaning Temporary Support. If any fragments of the film remain on the temporary support through imperfect transfer, or if the support should become dirty through use, it must not be washed. Cleaning with turpentine will restore it to a good working condition. Occasional cleaning with turpentine will be found a good means of ensuring that temporary supports work satisfactorily, even if there is no special reason to rectify any defect.



Fig. 10.

WIND-SWEPT MOOR.

R. D. Percival.



Fig. II.

Dr. T. Taylor Smith.

THE SMITH.

PRACTICAL INTRODUCTION TO CARBON PRINTING.

Preparation of Transfer Paper. The preparation of drawing paper for single transfer is a simple matter. A solution of gelatine is required, the most satisfactory strength being an ounce of gelatine dissolved in a pint of water. The gelatine should be soaked in cold water until it is thoroughly soft, about an hour is desirable. The cold water not absorbed by the gelatine should then be drained off as closely as possible, and sufficient boiling water added to make the total quantity twenty ounces. Twenty grains of chrome alum should be dissolved in two ounces of water, and the solution added to the gelatine, a little at a time, with vigorous stirring. Only sufficient of the gelatine should have the chrome alum solution added for giving one coating to the paper. More of the gelatine should be similarly treated when required. Twenty ounces of solution will be sufficient for giving one coating to six sheets of paper, imperial size. If the gelatine solution sets it becomes useless. The chrome alum renders it insoluble.

Coating the Paper.

The sheet of paper to be prepared is laid on a drawing-board or table, and a thin coating of the hot gelatine applied by means of a camel hair-brush or sponge. The coating should not only be thin, but as even as possible, and care should be taken to avoid air bubbles. After drying, a second coating should be given, and if these two are kept very thin, a third application should be given. Three very thin coatings will generally be found more satisfactory than using the same quantity of gelatine in two applications. If any difficulty is experienced, the gelatine solution may be weaker, twenty-five to twenty-seven ounces instead of twenty being prepared from one ounce of gelatine.

Another Method. Many workers find the chrome-gelatine solution difficult to mix and apply to the paper. An alternative method is to prepare the paper with a plain solution of gelatine only. The strength and method of application should be the same as previously given, the only difference being the omission of the chrome alum.

THE PRACTICAL PHOTOGRAPHER.

After the last coating has been applied and the paper has dried, it should be immersed in a solution of chrome alum, the strength being seven or eight grains to each ounce of water. Rinsing in two or three changes of water is desirable after the chrome alum bath, and then the paper may be dried and stored for future use. It will keep indefinitely in a dry place.

Drawing Paper Double Transfer.

For a considerable time the limited choice of paper supports available for double transfer work was a considerable objection in my own practice. Working out the following method of using drawing or other papers has removed that objection, and probably many readers of the *Practical Photographer* will appreciate the advantage of being able to use their favourite papers for double as well as for single transfer.

Preparation of the Paper.

A solution of gelatine, preferably Nelson's No. 1, should be prepared and no chrome alum or other hardening substance must be used. The most satisfactory strength is one ounce of gelatine to make thirty of solution. Three or four thin coatings must be given, the total quantity of gelatine applied to the paper being more than for single transfer, but not sufficient to obscure the grain of the paper when dry.

Transferring the Prints.

For transferring to rough paper, the flexible paper temporary support must be used. The prints must be developed, alumed and dried in the usual manner. When ready for transferring, the prints on the temporary supports must be soaked in water until thoroughly limp. Pieces of the prepared drawing paper must also be immersed in cold water for ten or fifteen minutes. A solution of Nelson's No. 1. gelatine should be prepared, the strength being one ounce of gelatine in twenty of water. From half to three-quarters of an ounce of solution should be allowed for each whole-plate print. The gelatine solution may be prepared without weighing by taking a quantity of gelatine, soaking it in cold water for ten minutes and after draining off the unabsorbed water dissolving it by heat in the

PRACTICAL INTRODUCTION TO CARBON PRINTING.

water that it has absorbed only. When it is dissolved, sufficient hot water should be added to increase it to three times the quantity. This solution should be kept as hot as possible during the operation of transferring.

A print on the temporary support should be taken from the cold water; as much of the adherent water as possible blotted off, and laid face upwards on the squeegeeing board. The corresponding piece of prepared paper should be taken from the water and similarly blotted. Sufficient of the hot gelatine solution is now poured on the print, and made to cover the whole of the surface as rapidly as possible. Air bubbles or imperfectly covered spaces must be carefully avoided. The prepared paper should be quickly placed in position, face downwards, on the print, and firmly squeegeed into contact. When thoroughly dry the paper bearing the image permanently attached may be separated from the temporary support in the usual manner.

Hardening Bath. As the coating of the paper and the gelatine which unites it to the image are both very soft, a hardening bath is necessary. The prints after stripping from the temporary support should be immersed in a bath of formalin:—British formalin, 1 part; water 10-12 parts,—for two or three minutes, washed in two or three changes of water and dried. After drying they are sufficiently tough to stand comparatively rough treatment without injury.

Defects in Transferring. The only risk of imperfect results different from those specified in describing ordinary double transfer is in the application of the gelatine solution. Any portion of the print not well covered, is liable to imperfect adhesion. Air bubbles are similar in their effect to vacant spaces. Either the fingers or a glass rod may be utilised to assist the gelatine in flowing over the print, or to break air bubbles that may form.

Sensitizing Tissue. The *beginner* has been advised to commence with ready sensitized tissue, so as to ensure that his materials are in good condition. But those who

THE PRACTICAL PHOTOGRAPHER.

depend entirely on tissue sensitized by the manufacturers, realize that they cannot derive the full benefit of being able to produce prints in many shades of colour, unless they purchase tissue far beyond their requirements. The absence of keeping qualities in sensitive tissue renders this course prohibitive to the ordinary worker. The alternative course is to keep a stock of insensitive tissue and sensitize pieces as required. Unfortunately, tissue sensitized at home in the ordinary manner is distinctly inferior in working qualities and in gradation to that sensitized in the course of manufacture. In addition, gas in the drying room is a fatal objection.

A new Sensitizing Bath.

During the past year, as the result of a long series of experiments, I have worked out a method of sensitizing tissue at home, without any special precautions, and obtained results equal in every respect to those obtained on tissue sensitized in the manufacture. Gas in the drying room has no effect on the result. The sensitizing bath is:—

Potassium bichromate	4 drachms.
Citric acid	1 ,,
Strong ammonia	<i>about</i> 3 ,,
Water	25 ounces.

The potassium bichromate and citric acid should be dissolved in hot water, and sufficient ammonia added to change the orange-red colour of the solution to a distinct lemon yellow. The quantity of ammonia required will be approximately that given, but it will vary slightly with different samples of bichromate. The change in colour is the indication of the correct quantity. (For Wellington tissue the quantity of ammonia should be reduced to one-third.)

Sensitizing. For sensitizing, the solution must be as cold as possible. A piece of tissue should be immersed in the solution, face downwards, and turned over once or twice to ensure that no air-bells form on either the back or the face. It should remain in the bath for ninety seconds, and then be laid face downwards on a

Fig. 12.

CONTROLLED DEVELOPMENT.

H. W. B.



Fig. 13.

UNCONTROLLED DEVELOPMENT.

H. W. B.

(Compare the front of nearer cottage, road, trees in the distance, etc.)

FIG. 14.

UNDER-EXPOSURE.



FIG. 15.

OVER-EXPOSURE.



H. W. B.

PRACTICAL INTRODUCTION TO CARBON PRINTING.

piece of glass, and lightly squeegeed to remove as much of the sensitizing solution as possible. If any moisture should remain on the back it should be rapidly removed with a piece of blotting paper. The sensitized tissue should be lifted by two corners, drawn from the glass and hung up to dry. The most satisfactory method is to suspend the tissue from a lath, pinning it by two corners. Sensitizing may be done in full daylight. Drying must take place in a room darkened sufficiently to have no visible effect on silver paper. Drying should require from four to six hours.

Working Qualities.

Tissue sensitized in this bath will be very soluble, and in working will be equally satisfactory as freshly-made sensitive tissue. It will be equally satisfactory in gradation and brilliancy. The high-lights or unexposed portions of the print should be very pure.

Variations in Sensitizing.

The sensitizing bath may be made stronger or weaker than the formula given, the quantity of water alone being varied. A stronger bath will give less contrast in the prints, a weaker solution more contrast. The proportions given will be found best for ordinary work.

Advantages of Sensitizing.

Insensitive tissue will keep indefinitely in a dry place. However small the worker's requirements may be, he can keep a stock of insensitive tissue, and select one or more pieces and sensitize just as required. There will be no risk of loss of quality nor the necessity for using a quantity of one colour. He may choose the colour most suitable for each subject, and sensitize at night for using the following day. The tissue will keep fully as well as ready sensitized.

With this sensitizing bath the small worker has the same advantages as the large consumer.

Carbon Transparencies.

By HARRY INKPEN.



CARBON transparencies are photographic prints with glass as foundation instead of paper. These may be divided into two classes :—(1) Those used as lantern slides, and (2) Those used as media for making enlarged negatives in the camera. At first it may appear to a beginner that there is no difference between the two, but they are vastly different in character, for the highest lights of the lantern slide are clear glass, with not too much density in the shadows, while the transparency intended for production of an enlarged negative shows every detail both in its highest lights and deepest shadows. It is evident, therefore, that a lantern slide will be a poor transparency for making an enlarged negative, and the transparency best suited for the latter will be utterly useless for the former. With this exception the method of procedure is exactly the same for both.

Transparencies are made from specially-prepared tissue, containing pigment extra finely ground. They are printed, mounted, and developed exactly as an ordinary carbon print, using a glass plate as a support instead of a piece of single transfer paper. The glass plate must first be coated with gelatine which has been rendered insoluble by the addition of bichromate of potash or chrome alum. These plates may be purchased from the various makers of tissue, but it is not a difficult matter to make use of old negatives. Select as many negatives as required, free from scratches and other defects, and immerse them in water containing a little hydrochloric acid, say 2 fluid drachms to a quart of water. After a few seconds it will be found that the film will strip easily. Put the clean glasses into another dish of clean water containing a small quantity of hydrochloric acid. This is to ensure getting them quite free from grease. As soon as all are clean, rinse well and

CARBON TRANSPARENCIES.

wipe dry with a clean cloth, and polish with a very dry cloth which is not fluffy. Put the plates in some place where they will be ready to be taken one by one to coat with gelatine, for preference in an ordinary negative rack.

Now to prepare the gelatine solution—Place 40 grains of gelatine (obtained from a photographic dealer—it must not be cooking gelatine) into $2\frac{1}{2}$ ounces of water in a flask or other glass or earthenware vessel suitable for heating to boiling point, and allow it to stand for a couple of hours. Then place in a vessel of water or sand bath over a fire or oil lamp and gently heat till dissolved. As soon as completely dissolved, add a few drops of a solution of bichromate of potash. The strength is immaterial, provided it is not too strong. I add 1 drachm of the bath I use to sensitize my tissue in (strength 1 oz. to the pint). Instead of bichromate of potash, 1 grain of chrome alum previously dissolved in 2 drachms of hot water may be added drop by drop, *stirring all the time*, or it will probably thicken like starch and be useless. The quantities above mentioned are a little less than generally recommended, but I have used them many times and they may be relied on. Make all very hot and then filter through cotton wool. Every vessel should be made hot before receiving the gelatine, as it soon begins to get cold by repeated flowing over the plates, and then it will not flow freely. Take a tuft of cotton wool and place it in a glass funnel. Through this pour a stream of hot water and let it run into the vessel which is to contain the gelatine. The hot water washes through all those broken particles of cotton wool which must inevitably break off from the tuft, and if not removed, will get into the gelatine and hence upon the plate. Quickly pour away the water and immediately filter the gelatine. It is now very hot and a number of plates may be coated before it gets too cool to run freely over the plate.

Take a clean glass plate, and having lightly dusted it, hold it by its edges over a lamp to warm it. This serves the double purpose of helping to keep the gelatine hot, and of setting free those bits of flying

THE PRACTICAL PHOTOGRAPHER.

fluff which get on the plate. A gentle breath will blow them away. Balance the plate upon the fingers and thumb of the left hand, and keeping it level, pour a good pool of gelatine on the middle of the plate; enough nearly to reach the two sides of the plate, and by very gently dropping one end, it may be allowed to flow, first to the farthest two corners, and then to the nearest end, finally running it off by one corner into the vessel again. Rock the plate backwards and forwards to prevent ridges, and to drain off all superfluous solution, wipe the edges with a bit of rag or a tuft of cotton wool, and place in rack to dry.

To a person who has varnished a negative, this will be an easy matter, but to the novice it will require a little practice, for if he once allows the solution to run over the edge, his chances of successfully coating the plate are gone. If possible, it is also better for the gelatine to be kept moving in all directions at the same time, as there is then no danger of ridges on the plate, which will occur if the plate be too much heated and the gelatine allowed to stand for a second or two.

When the plates have all been coated the rack is put aside in a place free from dust, so that the plates may dry, and they are then placed in a strong light to render the gelatine insoluble. This will not be longer than it would take to print an ordinary carbon picture. Each plate is now ready to be used as a support for the printed tissue.

Proceed now as for ordinary single transfer, using a glass plate instead of a piece of paper. All remarks with regard to mounting, development, etc., apply equally to the making of transparencies. The picture, of course, will be reversed, and this must be remembered when the enlarged negative is made. If the enlarged negative is to be printed in carbon, it is only necessary to place the transparency in the camera in the usual way, and the reversed transparency will result in a reversed negative, and hence single transfer only will be necessary. If, however, it is desirable that the enlarged negative should not be reversed, the film of the transparency should be turned towards the illuminant.



ON THE TOP
OF
THE TIDE

P.C. 6

The Carbon Process for Winter Evenings.

By F. PINDER.



TO carbon workers who reluctantly give up this process when the weather becomes dull and the long winter evenings are irksome, the following hints may be of some use:—

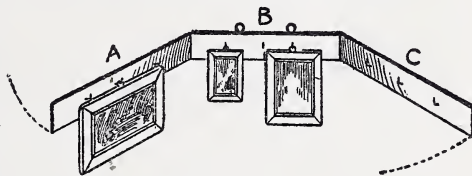
It is not, I think, generally known that the sensitive tissue may be printed by the light of an incandescent burner, yet such is the case, and the method certainly has its advantages.

(1) The use of the actinometer or test is entirely dispensed with, for having the one unvarying light the exposures are determined by *time*.

(2) The saving of time is very considerable, for having no tints to match, etc., one can sit and read his "Practical," entertain a friend, and in general pass the time without the slightest anxiety, as the frames require no attention whatever during printing.

(3) The ease with which negatives of different density may be printed from at the same time.

The accompanying sketch shows how the frames are suspended round the light while still allowing sufficient illumination to the room.



A, B and C are 3 pieces of wood about 15 inches in length and hinged so as to fold flat when not in use. The central piece B should be hung on 2 hooks at such a height as will allow the frames to hang on a level with the burner; the sides A and C can then be moved either nearer to or further from the light as required, according to the density of the negative. This will allow of 6 half-plate negatives (or 3 of a larger size) being printed from at the same time, and their varying density, if any, may be balanced by their proximity to the light.

THE PRACTICAL PHOTOGRAPHER.

The exposure is necessarily dependent upon the quality of the negative and its distance from the light. For a negative of average density I have found $1\frac{1}{2}$ hours at 9 inches from the light to be quite sufficient. The larger the frame the further from the light must it be hung in order to secure more even illumination, whilst smaller frames may be placed as near as 6 inches without the tissue being damaged by the heat of the gas, but this is not advisable unless the negative is very dense.

My experience is that a good bold negative is the most suitable; yet I have obtained successful results from a thin one by using an opal chimney and exposing about the same length of time.

A good plan is to arrange the frames for a two hours' exposure, and set an alarm clock in case one gets too absorbed in some other occupation.

Subsequent treatment is the same as if printed by daylight.

An Effective Actinometer.

By R. R. RAWKINS.



A RELIABLE actinometer is essential to the carbon worker. It may be admitted that there are many effective ready-made instruments on the market. Many of them rely upon the use of yellow glass of varying degrees of opacity, and here I think lies the source of many a failure to secure even results, because in practice it has been found that if the printing light is weak or yellow it will penetrate a black and white negative, but fail to get through the yellow glass of the actinometer.

An ideal actinometer is one consisting of a definite series of steps or gradations of pure silver in gelatine, as near as possible like the class of negative used. The carbon printer frequently requires several actinometers to be in action at one time, and therefore it is absolutely necessary that they should be exactly similar in density. Both these requirements are met in the following method: This consists briefly of exposing a gelatine film to light, developing an even grey fog, fixing,

AN EFFECTIVE ACTINOMETER.

washing, and drying as usual, and then cutting it up into strips of varying length. These strips are placed upon one another in steps from one to ten, and numbered.

In order to secure perfectly even results the film should be very carefully exposed to light by pinning down the film to a piece of cardboard and making an exposure at some distance from a well-diffused light. The distance from the light and the exposure are important factors, as it will not be found practicable to make a haphazard exposure and only slightly develop the fog. If an optical lantern is available the question of obtaining perfectly even illumination is a simple one. As some sort of guide I may mention that the best results were obtained with an incandescent burner in the lantern, condenser six inches, lens working at $f11$, distance from the empty carrier to easel ten feet, and exposure half a second. The film can be developed with, say, metol and an even grey fog obtained.



After fixing and washing it should be squeegeed as usual, and when dry cut up into strips upon a piece of glass, using another glass as a cutting guide. The strips should then be cut up into varying lengths, carefully adjusted, and the whole thing bound together at the thickest end with a piece of gummed paper. The actinometer is then placed on a piece of glass, quarter-plate size, and fastened down in position by means of lantern slide strips gummed down over the edges. The whole of the other part of the glass should be covered with black paper, leaving only the space for the actinometer and allowing a portion of clear glass to show. The numbers should be written on the films in opaque colour (in reverse), commencing at "0" for clear glass up to 10, which is practically opaque. It should now be varnished with celluloid varnish.

In printing it will be found that P.O.P. is most suitable, but the same kind should always be used. When the first number shows quite plainly this is called one tint, and after a test exposure has been made it is advisable to keep the P.O.P. strip and mark it with a suitable number or title, in case duplicates are required. When the exposure for a particular negative in a certain colour tissue has been arrived at, the number of tint that shows plainly on the actinometer strip should be written on the negative.

Carbon Wrinkles.

By HARRY E. STADDON.



DRYING Tissue.—If carbon tissue is improperly dried after being sensitized all hope must be abandoned of obtaining perfect results. It is therefore essential that this should have more attention paid to it than is generally recognised. An effective method is to lay the tissue after being sensitized face up on some corrugated cardboard (used for packing bottles) which has been placed in a suitable position. Good air currents will thus flow between the tissue and cardboard, causing the tissue to dry evenly and efficiently. Care must be taken, however, not to place the tissue so that particles of foreign matter may settle on it.

Safe Edge.—If a proper fitting frame is used for printing, the safe edge is sometimes dispensed with, as the edge of the frame leaves nothing to be desired. This method, however, is not to be advocated. A good plan to adopt for small prints is to utilize the face portion of a slip-in mount. The margin of the mount can be cut down to the desired size. By this means a quarter-plate picture can be taken from any part of a half-plate, or, in fact, any other sizes, and is an effective safe edge when used in the usual manner. The card should be placed between the frame and negative.

Fig. 17.

FRESHLY SENSITIZED TISSUE.



Fig. 18.

STALE TISSUE.

H. W. B.



Fig. 19.

Miss Sylvia Cardwell.

Amée.

Mounting Tissue for Development.—In cold weather a difficulty may be experienced when dealing with large work and heavy transfer supports of obtaining good adhesion. This difficulty is remedied by floating the tissue (after being soaked in the usual manner) on hot water, say 90° , for about 2 seconds. By this means good adhesion has been obtained without reticulation, after the tissue has been manipulated in the usual way and found ineffective in adhering to its support.

Local Development.—A soft hair brush or cotton wool may be used for local development. The brush method is better in some workers' hands than wool, as the latter has a knack of moulting and leaving particles on the film. Local brush development is better performed if the film is allowed to cool down, as it is then more tough and workable. Neither of these methods can be employed when the development has been carried out with very hot water on account of the film being fragile. In these circumstances the following is a good method of procedure: Obtain a wide-mouth bottle—such as a pickle bottle—and bend two pieces of soft glass tubing (as in diagram) in a gas flame. One tube should nearly touch the bottom of the bottle, whilst the second need only reach half-way. This can now be used as a syphon by fixing the tubes through the cork and applying the lips to the shorter of the two tubes. The hot water is thus drawn into and expelled from the bottle on to the desired spot.



Spotting Prints.—It is oft-times difficult to obtain the exact tint for spotting out defects on carbon prints. This may be easily remedied by keeping the original backing sheet of the tissue. A few drops of hot water placed on the pigment still found adhering to this support will supply all that is necessary for spotting. Spotting should not be undertaken until the print is dry and should err on the light side as most colours dry darker than they appear when wet.

The Chemical Aspect of Pigment Printing.

By T. THORNE BAKER, F.C.S., F.R.P.S.



ARBON and gum bichromate printing appear at first sight to be essentially such æsthetic methods that chemistry is the last thing one would think of in their connection. Yet the chemistry of the carbon process is extremely interesting, inasmuch as we know almost exactly what takes place during and after exposure of the sensitive paper to the light. There is no "latent-image" mystery about it, so we are enabled to examine the subject from a chemical point of view with the satisfactory assurance that we are not working in the dark.

The basis on which the process works is simple in the extreme, and may be summed up as follows:

(1) A bichromate salt *plus* gum is exposed to light, and oxygen is evolved.

(2) The oxygen combines with the gum to form a kind of varnish.

(3) This varnish is insoluble in water, and therefore retains any pigment or "carbon" which may be mixed with it.

As early as 1862, when photographs had become fairly popular, some attention was directed towards substituting for silver some permanent substance of less value, and so the carbon or pigment process was eventually arrived at. In 1855 Poitevin had taken out a patent* for a "Carbon method." A mixture of potassium bichromate, gelatine, and finely-powdered carbon was used to spread over the paper, which was developed with hot water after printing. The water dissolved that portion of the gelatine not acted upon by the light, leaving the remainder insoluble. Further methods, similar to this original one, were brought out in due course by Fargier, Swan, Johnson, Sawyer, and others. Such fine results were obtained that in point of brilliancy the carbon process equalled

**Vide* Vogel's Photographie, 1900.

THE CHEMICAL ASPECT OF PIGMENT PRINTING.

silver printing processes, and now excels them in some respects, and especially as regards the permanency of the finished prints.

The year 1855 has been mentioned as the date of Poitevin's patent for making carbon paper, but the discovery of the sensitiveness to light of bichromic salts dates back to 1839, and in 1852 Talbot took out a patent for the employment of potassium bichromate and gelatine in the production of steel plates for photo-engraving. Photogravure, and photo-engraving generally, depends chiefly on the sensitiveness to light of salts of chromic acid.

The latter-day modifications of gum printing differ little from the original methods, and this is because the basis on which they all work is so extremely simple; ozotype, the method of gum printing due to Mr. Thomas Manly, is the only one which requires special attention. The recent idea (which emanated from the Continent), of mixing a ferric salt with the gum, has not as yet received much attention.

A solution of gelatine such as, for example, ten parts of Nelson's No. 1 gelatine in one hundred parts of water, when mixed with a certain proportion of potassium bichromate, may be coated on glass, and dried in the dark. If now, without exposure to light, the coated glass be placed in hot water, the gelatine film will melt. Had the glass "plate," however, been exposed to light for a few minutes, warm water would not have the power of dissolving the gelatine, the oxygen of the chromic salt evolved on exposure having combined with the gelatine and rendered it insoluble.

In practice a so-called "tissue" is used. This consisting of a piece of thick paper of the requisite size, which is coated with a mixture of soft gelatine and a very finely ground pigment, not necessarily carbon, but varying in chemical composition according to the colour of the tissue. Thus "carbon tissue" may perfectly well mean thick paper coated with gelatine and burnt sienna, the name being thus inadequate and misleading.

If the bichromate is not mixed with the gelatine and pigment in the first place, the tissue has to be sensitized a day or two before use by immersion

THE PRACTICAL PHOTOGRAPHER.

for two or three minutes in a two per cent. solution of potassium (or other) bichromate, less time being required in warm than in cold weather. The sensitizing may be done in gas or lamp light, but the drying of the tissue should be done in darkness.

It has recently been found quite practicable to dry the tissue rapidly after it has been sensitized, and to do this is often desirable when time is of consequence.

After the tissue has been soaked in the bichromate solution for the requisite time, it is placed in methylated spirit for five or ten minutes, and then hung up to dry. In this way it will be dry in a few minutes, and will be found to act perfectly satisfactorily.

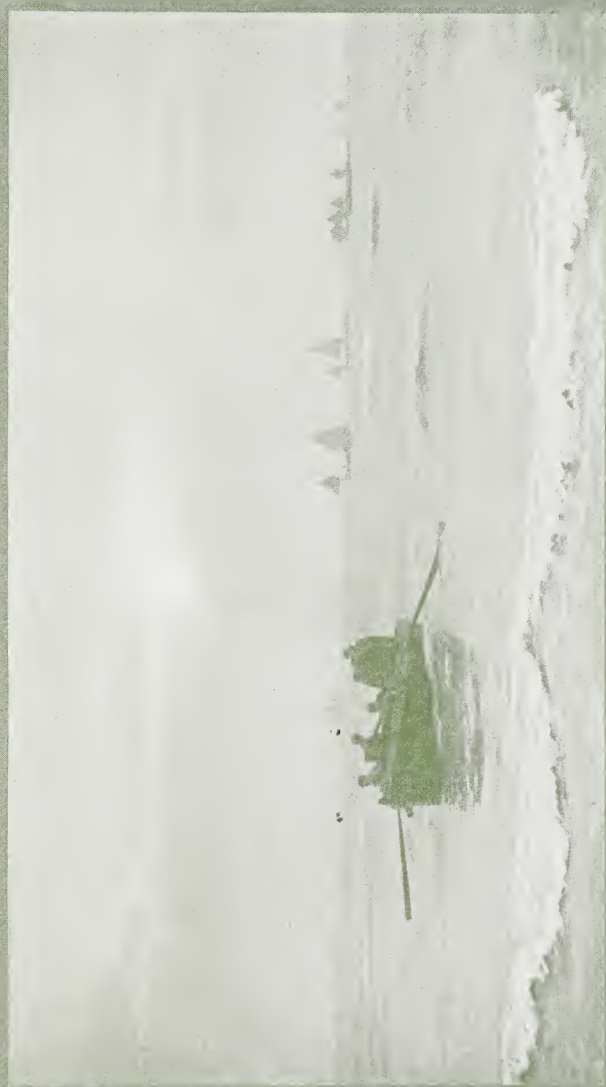
A common question in connection with pigment printing is whether the sensitizing bath should be acid or alkaline. It is better to employ an acid than an alkali, as the acid renders the gelatine in a more plastic condition if used in sufficiently small quantities, whilst ammonia merely tends to decompose the gelatine or gum, that is, if it does anything at all.

A small proportion of acetic acid may be employed if desired, and it seems possible that tissue sensitized in such a bath might keep better than that sensitized with a normal solution. We have never found it necessary to do other than use a two per cent. solution of potassium bichromate, and have obtained practically perfect gradation in this manner.

Commercial glue or gum can be prepared by dissolving gelatine in acetic acid, and glue which is not strongly acid is quite amenable to treatment with a bichromic sensitizer.

When once light has been allowed to act upon a colloid sensitized with bichromate, the action continues even when the exposed material is kept in the dark. The explanation of this *may* possibly lie in the peculiar nature of colloidal substances.

Take gelatine, by way of example. There is homogeneous intercellular communication in it. A coloured solution will migrate through a jelly at a definite rate. If we place a crystal of cupric



Homeward by the evening light.



Fig. 21.

W H. Rundle.

THE BLACKSMITH.

THE CHEMICAL ASPECT OF PIGMENT PRINTING.

sulphate at the bottom of a dilute or "thin" jelly, the blue coloration will rise upwards at a speed which is apparently constant. We have "charged" the gelatine solution with cupric sulphate, and by means of its colloidal structure work is going on.

It seems possible, therefore, that when once light has been allowed to act upon a bichromatized colloid, a store of energy which is capable of distribution *throughout the entire film* has been set up in the exposed portions.

The preceding matter applies primarily to "carbon" printing, though practically all of it applies equally well to pigment printing, including the method known as "gum bichromate" or "bi-gum."

Gum arabic, being a colloidal substance, may be sensitized by bichromate in the same way as gelatine.

Rough paper is brushed over with a strong solution of potassium or other bichromate, and dried. It is next brushed over with a solution of gum arabic in water, plus the colouring material. When dry it is exposed and developed, only with the difference from a carbon print that the image remains on its original support from first to last.

In ozotype we find another modification of the carbon process. A paper support, sized with some gelatinous substance, is coated with a special sensitizing solution and exposed under a negative. A visible image is then produced. The print is washed, and then upon it is squeegeed a pigmented paper which Mr. Manly terms a "plaster." The two are now left for half an hour, and next developed in hot water.

An important feature in the process is that when the print and pigment are to be immersed together, previous to squeegeeing, they are placed in a special solution containing some reducing substance, such as hydroquinone or ferrous sulphate, and an acid.

Either ozotype prints, or carbon or bi-gum pictures, can with advantage be treated with a hardening bath previous to their final washing, and one containing five parts of potash alum per hundred parts of water is as good as can be desired. An acid bath is not desirable, unless very thorough washing be given afterwards.

Chemical Notes for Carbon Workers.

By J. H. WATSON.



OME of the following jottings may prove helpful to those experimentally minded workers who occasionally feel tempted to stray from the beaten path of daily routine.

Solvents.—Gelatine is soluble in acetic acid, dilute hydrochloric, oxalic and sulphuric acids, potassium and sodium carbonate, magnesium sulphate, ammonia, caustic potash, caustic soda, barium chloride solutions.

Preservatives.—Decomposition or putrefaction is arrested or deferred by dilute solution of carbolic acid or salicylic acid.

Chromated Gelatine, i.e., by use of bichromates, if kept dry and in the dark is soluble in hot water after a very considerable period. If kept in the dark, but moist, it soon becomes insoluble. If in solution and boiled it becomes insoluble. Bichromated gelatine, slowly dried, becomes insoluble.

Precipitated Gelatine.—Dilute chromic acid precipitates gelatine from solution. This precipitated gelatine may be melted by heat, but if once dried it becomes insoluble apart from any action of light. Note the difference between chromic acid and bichromates. Commercial bichromate may contain free chromic acid, hence the advisability of adding sufficient ammonia to turn the solution from orange to yellow when preparing a sensitizing bath. The yellow (mono) chromate of potassium may be used to render gelatine sensitive to light, but the gelatine is then only one-twenty-fifth as sensitive as when the orange bichromate is used, but the yellow (mono) chromate of ammonium confers sensitiveness about equal to that obtained with the potassium bichromate.

Bichromate Poisoning.

By R. DALE.



POTASSIUM bichromate taken internally acts as an irritant poison. The symptoms are acute pain in the abdomen, frequent vomiting and purging, cramp in the legs, dilated pupils, general depression, weak pulse, clammy perspiration. Antidotes. An emetic of a table-spoonful of mustard powder in a tumblerful of warm water, carbonate of magnesia, chalk and water, white of an egg in milk or water. Warmth should be applied to the limbs.

Bichromate may find its way into the system by being inhaled as a fine powder floating in the air. Some, but by no means all, persons are susceptible to bichromate poisoning by immersing the fingers in a solution of the salt as in a carbon sensitizing bath. Should the skin be broken, blistered, cracked or cut, this is far more likely to be the case. When the skin is quite sound such persons should use rubber finger stalls when dabbling in the sensitizing bath. Many people, however, are able to put their fingers in the solution constantly and experience no inconvenience whatever.

General effects on the system — Produces irritating eruptions not unlike eczema or psoriasis, sometimes developing into ulcers, which seem to select the worker's knuckles for special attack. Those who are susceptible find the nose frequently attacked, sneezing produced, increased flow of tears, inflammation of the eyes (conjunctivitis, etc.). The septum of nose is particularly liable to attack, but the nasal walls seem seldom if ever affected. The sufferer often complains of a nauseous bitter taste.

Remedies—(1) Citrine ointment, otherwise “*unguentum hydrargyri nitratis*,” has been found efficacious in many cases. It is prepared as follows:—In 12 parts of nitric acid dissolve 4 parts metallic mercury by the aid of gentle heat; in 32 parts of olive oil dissolve 15 parts of saltfree lard.

THE PRACTICAL PHOTOGRAPHER.

Now bring both solutions just to the boiling point, then add the mercury solution to the lard solution, and stir well until it froths freely. It will now occupy six times its original space, so a duly large vessel must be used for the mixing. (The above parts all by weight). (2) A soothing lotion is prepared by combining glycerine, $\frac{1}{2}$ oz.; alcohol, 5 oz.; carbolic acid, 60 drops. (3) Calvert's carbolic ointment may be used. (4) The sub-acetate of lead solution of the Pharmacopœa has also been recommended. (5) Old bichromate sores may be painted with a 5-grain-to-the-ounce solution of silver nitrate if they show a tendency to return.

Cold sensitizing bath solution causes smarting rash, which may fester or ulcerate, resulting in a wound obstinate in healing.

Warm dilute solutions, as in developing, chiefly attack the back of the hand and between the fingers, producing small watery pustules. The skin dries and excoriates, leaving irritating sores or cracks, and yields painful openings. The palms of the hands do not seem to be attacked at all. *A worker of many years' experience states that he has never known anyone working carbon as an amateur to be affected.*

General cautions.—When dabbling in bichromate solutions have at hand a dish of water containing a little ammonia. Keep constantly rinsing the fingers in this solution. The ammonia will help one to locate any scratch, or broken skin. If they smart apply the mouth and suck for a few seconds. Finally, wash the hands in warm water, using carbolic soap and a nail brush. The poison is most likely to lurk round and under the nails.



Printing Carbon Tissue by Magnesium Light.—Fig. 16 is reproduced from a print made by burning 8 feet of magnesium ribbon 4 inches away from a quarter-plate negative. F. C. L.





Fig. 22.

EVENING ON THE WEAR.

W. Milburn.

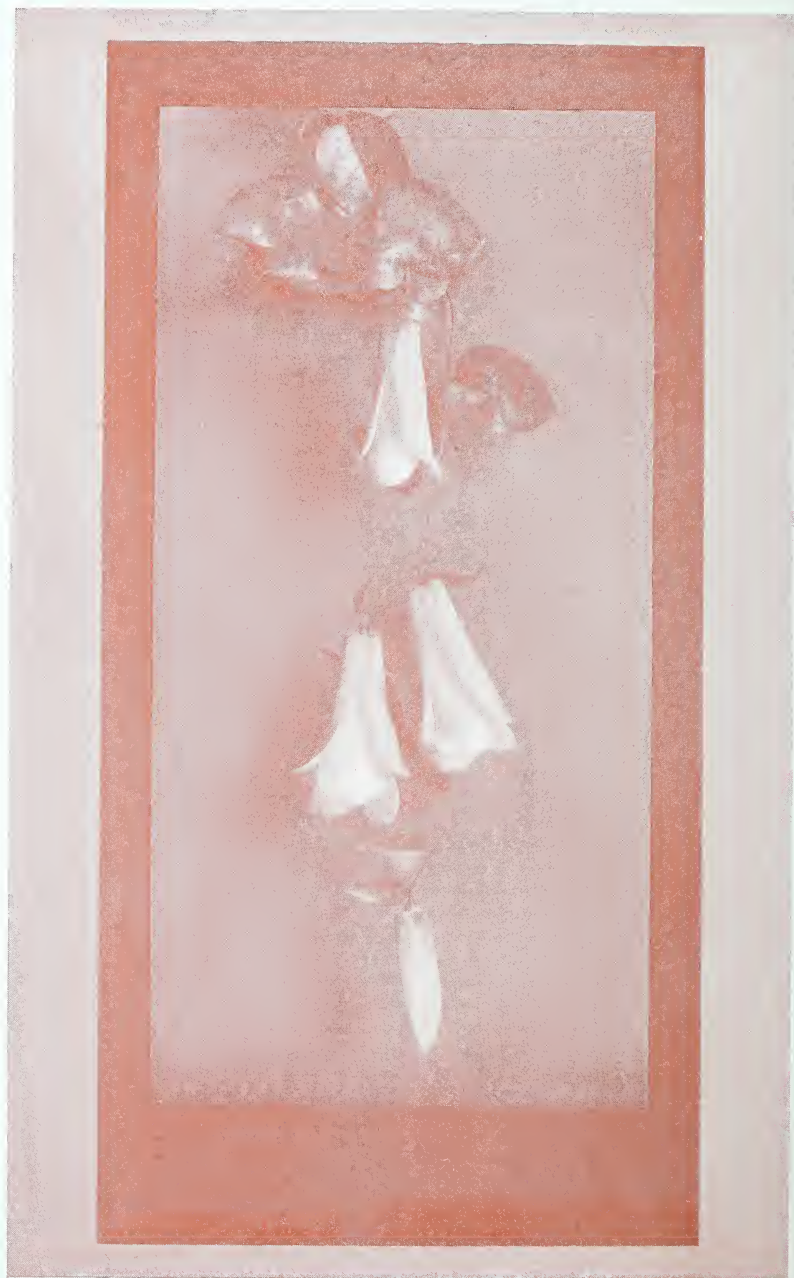


Fig. 23.

DECORATIVE FLOWER STUDY.

P. Barrett.

Jottings.

By THE EDITOR.

1. When drying the tissue after mounting on to single transfer let it lie between blotting paper, under moderate pressure, not less than 10 and not more than 20 minutes.

2. Rough-surface single transfer paper should be soaked in cold water for an hour, and then for another hour in water as hot as the hand can bear. After mounting, put under moderately strong pressure for 20 to 30 minutes. The mounted tissue should be laid on two sheets of blotting paper and covered by two sheets at least, and then covered by a board on which may be laid a 14-lb. weight or a pile of books, or a couple of bricks neatly wrapped up in brown paper.

3. Tissue mounted on temporary support should be under moderate pressure, between blotting sheets, for about 20 minutes.

4. The lighter the colour of the tissue the more of it must be rendered insoluble by light to give vigorous shadows, therefore the longer printing. For example, suppose we had a light and a dark red tissue to print; for corresponding vigour of images the light red would require more pigment retaining for the shadows and consequently longer printing.

5. Roughly put, it takes about one-third to one-half the time to print carbon tissue as compared with P.O.P., the same light and negative being used in both cases of course.

6. A small tea pot is very useful for applying hot water to any selected part of a print which may conveniently be supported on a sheet of zinc.

7. The print developed on a temporary support should be *evenly* dried by a current of air, without the aid of artificial heat.

8. If a print on a temporary support is very dry

THE PRACTICAL PHOTOGRAPHER.

and inclined to be curly, it should be left in a damp place for an hour or so before transferring.

9. By using fine-ground opal glass as a temporary support we may give the surface of the print a fine matt surface effect. In many cases this is preferable to the shiny surface imparted when ordinary flexible temporary support is used.

10. "Carbon tissue" is seldom carbon and never tissue, for a tissue, correctly speaking, is something woven, and in the majority of cases the pigment used is not the chemical element carbon.

11. After a very little experience one can form a very fair guess as to whether a print has been under or over-exposed by observing how much pigment is adhering to the backing paper of the tissue when first stripped off in the developing bath. But, of course, this assumes fairly uniform conditions as to the temperature of the water when stripping takes place.

12. For applying the waxing solution to the temporary support nothing is better than a bit of tow (about the size of a walnut) wrapped up in a piece of old, clean flannel. The older the flannel the less likely is it to leave hairs on the support.

Carbon Transparencies for Window Decoration.—This is one of the most effective and decorative uses of this beautiful process. The procedure is precisely as described on another page for the making of transparencies. But the range of density contrasts should be considerably longer than when the positive is intended for enlarging. The tissue should be sensitized on a strong bath, and kept rather longer than is the case for ordinary use. Also a print taken from the printing frame should be allowed to "continue" for an hour or two to gain a little force. Prints from strongly-contrasted negatives should be mounted on clear glass. But if the negative be only of moderate density then opal may be used. In either case the film side of the picture is protected by a piece of clear glass. The two may be bound together like a lantern-slide or put in a transparency frame.

Transparencies as Framed Pictures.—One very charming use of the carbon process is to make a positive on plain glass the size of the picture frame. The print is then mounted and developed in the usual way, and is backed up (when dry) by a sheet of drawing-paper, which may be white or cream, rough or smooth, etc. The supporting glass is also the glass of the picture-frame. One or two experiments will teach the student that a paper-backed transparency must be somewhat thin and delicate when looked through in the ordinary manner. For certain unusual effects the use of tinted backing-paper may be permitted. But these are quite exceptional, and should not be adopted without thought, and if possible, advice from some friend with cultured artistic taste. Prints on clear glass may also be backed-up by a piece of fabric. To keep this flat the edges of the fabric should be folded over a piece of thin card and fastened down to the back of the card by means of strips of gum-paper. Fine canvas, nainsook, Japanese silk and muslin may all be used. Fabrics are particularly suitable for flowers, fruit, and other like objects of a decorative nature.

Carbon Transparency for making enlarging should have detail and gradation in every part, yet without a very extended scale of densities. A suitable transparency should look clear and bright when laid film side down (dry, of course) on a sheet of smooth white paper. The white paper should just show through the very highest lights.

Cutting up the Tissue.—If the tissue be purchased in rolls or “bands” (30 inches in width) it will be necessary to cut it up into pieces to suit the size of print required. On unrolling the tissue it will be found to be rather elastic or springy; we therefore need four paper weights. These may very conveniently be made by wrapping up a dozen old quarter-plate negatives neatly in brown paper and fastening down the edges of the package with gum or sealing wax. A sheet of zinc or glass or mill-board may be used as a cutting table. A sharp, short, stiff-bladed knife is required. As a guide use a metal straight edge. A T-square also is desir-

THE PRACTICAL PHOTOGRAPHER.

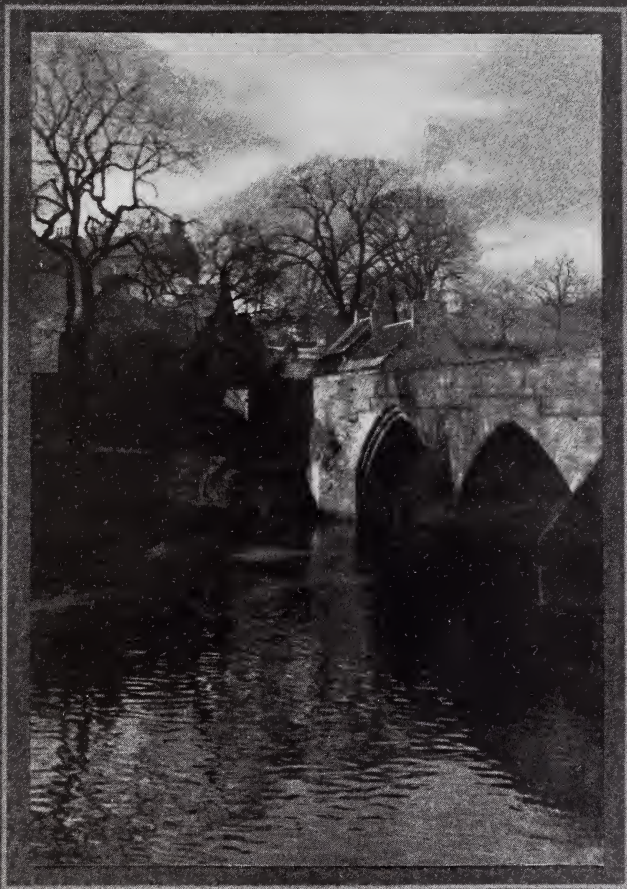
able, though not essential if one has an accurate eye. The tissue should be cut from the back, *i.e.*, with the coated side downwards. This enables us first to mark our cutting lines with pencil on the paper backing and thus by a little contriving exercise economy. A few pieces of card cut to the various sizes of our negatives will be found helpful in arranging the cutting up to best advantage.

Along the edge of the band will be found a strip of about half an inch which is not quite stiff or evenly coated on the outer parts. This rough edge may desirably be cut off and discarded. It is helpful to have one's zinc cutting sheet squared at all four corners and marked along the margins with notches an inch apart. We can then dispense with a T-square, and also can cut odd sizes of just as many inches as may be required. The cut pieces may most conveniently be stored face to face and kept flat by pressure. This is a convenience when sensitizing.

Non-reversed Prints by Single Transfer.—Where the negatives are not less than half-plate size and sharp definition is not required, we may, after carefully cleaning the glass side of the negative, put this side in contact with the tissue and print the negative film outwards. In this case the printing frame should lie at the bottom of a box which is but a little larger than the printing frame. The box should be not less than a foot deep. The inside of the box should be blackened or lined with dark brown paper. In place of a box we may employ four pieces of strawboard with their edges held together by strips of tape and glue. The printing frame may conveniently be put on a table out of doors and the card tunnel put over it so that printing is done by zenith light.

Of course a certain degree of softness or loss of fine detail results. This depends on the thickness of the glass and depth of the tunnel.

If in doubt as to whether a piece of carbon tissue has been printed or not, and it is so dark that no picture is seen, one can generally detect some part of any printed picture present by breathing on the surface of the tissue.



Cramond Brig
Mid-Lothian.



Fig. 25.

Miss Maye Bruce.

Transferring Prints to Unprepared Paper.—The picture is first developed on fine ground glass (previously waxed, of course), alumed and dried in the usual way. It is then coated with a 3 per cent. solution of gelatine and allowed to set on a levelled slab of glass. In an hour's time the unprepared paper is slightly damped and then squeegeed down upon the gelatine coating, allowed to dry and then easily stripped.

Collodion Surface on Flexible Support.—The tissue for this process requires somewhat underprinting on account of the continuing action involved. The tissue should be an inch all the way round larger than the picture. After printing, this extra inch is folded up, forming as it were a kind of paper dish or tray. This is laid on a sheet of glass and thin collodion poured into this paper tray. The glass is tilted in all directions to coat the surface of the tissue evenly. The superfluous collodion is poured out of one corner of the tissue tray. The coating is allowed to "set," then washed until all greasy appearance is removed, and then mounted on flexible support. In due time it is developed and transferred, when it has, of course, a collodion surface. Care must be taken to avoid getting any collodion on the back of the tissue or marks will result.

Caution.—Do not attempt to transfer a print direct to ordinary artist's canvas. The bichromate which works out of the tissue will form an ineradicable yellow stain (of lead chromate). Similarly a print transferred direct to ivory will produce a stain.

Hence the double transfer process is employed in these cases. Moreover, in the case of ivory, the application of hot water may cause bulging. Artificial ivory, *i.e.*, opaque celluloid, may be used for single transfer as it does not seem to be affected by bichromate staining.

Preparing Ivory for Transfer.—To clean the surface of ivory use a piece of fine grain cork or rubber, and polish with powdered cuttle fish and a little water, using a light continuous circular motion.

THE PRACTICAL PHOTOGRAPHER.

Intensifying Carbon Transparencies.—The following method, which will be noted as only a slight variation of that given for paper prints, is particularly suited for transparencies: A. Dissolve 24 grains of silver nitrate in 4 oz. distilled water, and add strong ammonia, drop by drop, until the precipitate first formed is re-dissolved. B. Water, 4 oz.; citric acid, 30 grs.; pyrogallie acid, 20 grs. C. Water, 4 oz.; silver nitrate, 10 grs. Solution A will keep a long time, but B and C should only be prepared as wanted. First soak the transparency in A for five to ten minutes. Rinse under the tap, and lay in a *clean* dish. Then mix B and C, and at once apply to the plate. When sufficient density is reached rinse. Fix in a clean 10 per cent. hypo bath. Wash and dry in the usual manner.

Intensifying Carbon Prints.—Soak the print in water until evenly flacid. Drain and immerse in water 10 oz., silver nitrate 20 grs., for three minutes; rinse both sides of the print in the spray for a second or two. Then immerse in water 10 oz., citric acid 10 grs., pyrogallie acid 8 grs., for a few seconds. Then return this solution to the graduate, and add to it a dram of a ten per cent. solution of silver nitrate, and at once re-apply to the print. After sufficient density has been acquired, fix in clean hypo and wash well.

Second Method.—Prepare a 15 grain per oz. solution of potass permanganate in cold water, immerse the print in this and then wash. If too great intensification results, bath in a dilute solution of ammonium sulphide.

Intensifying Carbon Prints, and imparting a rich blue-black colour.—Soak the print in a one per cent. solution of iron perchloride, rinse lightly, and transfer to a half per cent. solution of gallic acid.

To Impart a Greenish Tinge, first soak in a five per cent. solution of sulphate of iron, rinse and then transfer to a five per cent. solution of potassium ferrocyanide.

Blue-toning Carbon Prints.—Before aluming, the print is soaked in a luke-warm strong decoction of logwood. The print is lightly rinsed and dried.

Reducing Carbon Prints.—If a print has been over-exposed, *i.e.*, over-printed, it may sometimes be saved by continuing development for some time in warm water, to which has been added a solution of ordinary “chloride of lime.” To prepare this solution, take a tablespoonful of chloride of lime, and stir well with a pint of tepid water; then allow the sediment to collect, and decant the clear part for use. Of this, add about one ounce to each pint of water in the developing bath, and allow this solution to act for some considerable time, as its softening action is slow. If too slow more chloride of lime solution may be added. The print, when sufficiently reduced, requires careful washing in three or four changes of cold water.

Over-exposed Prints may sometimes be recovered by soaking in water 1 oz., ammonium persulphate 20 grs., sulphuric acid 4-5 drops.

Reproducing Negatives by the Carbon Process.—For this purpose it is best to use transparency tissue. The first step is to print a positive from the original negative in the usual way. This is mounted on glass and developed as a transparency. From this a second piece of transparency tissue is printed and in turn developed on glass yielding a second or derived negative. By this means we may make from a somewhat hard-contrast negative having abundant detail a second, much softer-contrast, negative and yet retain all the detail of the original. In other words, this enables us to reduce the scale of contrast without loss of detail.

Should the original be somewhat soft in general scale of contrasts then we must use tissue which has been sensitized on a weak bath, and print our positive in weak light—*i.e.*, in a room some little distance from the window. Printing should be fairly generous, but not markedly excessive. These modifications will tend to accentuate contrasts. When making the second negative from the positive similar tissue and weak printing light is to be employed.

Variations of Printing Light.—In general it may be said that the stronger the light the more penetrative its value. Thus, suppose a certain

negative requires printing 5 tints by diffused daylight, it will require printing only about 4 tints if printed in direct sun—but will require a full 5 or perhaps 6 tints if printed in very feeble light.

Spectrum sensitiveness of carbon tissue.—The chromates and bichromates are more absorbent of the greenish blue rays than are the silver haloids. Hence we can understand how it is that the relative printing speeds of tissue and P.O.P. are different at different times of the day and year. Thus, the tissue becomes relatively quicker than silver paper in winter when the greenish blue rays are stronger.

Cloud Printing in the Carbon Process.—The first step is to ascertain the exact actinometer numbers for the land and sky parts on two separate trial strips of tissue. The two negatives are now held up together, and the junction line of land and sky carefully pencilled upon a piece of tracing paper held up at the same time as the two negatives. The tracing paper is now carefully cut along the pencil line. Each part is laid on a sheet of opaque orange paper, and the counter part carefully cut out. We have now our two orange paper masks for our cloud and landscape negatives. On the glass side of each of the negatives, we fix its corresponding mask by a rim of thin gum water. Thus the cloud negative has the land part masked out, and the landscape negative has its sky masked out.

Now suppose we are using two negatives of different size, say a whole-plate landscape, and a 10×8 sky negative. Lay the smaller on the larger in the previously determined position. The negative films must of course not be in contact, but both the same way, *i.e.*, towards us. Then cut a piece of *thin* card the exact size of the larger, *i.e.*, sky negative, and in it cut an opening exactly corresponding to the size of the smaller negative. On the glass side of each negative fix lantern slide binder overlapping the picture size by the same width in each case, *e.g.*, $\frac{1}{4}$ inch for instance. The piece of tissue is cut the exact size of the smaller negative. We now begin by printing our landscape, and before removing from the frame, we mark on



10
100113



Fig. 27.

SOUTH AISLE, BUILDWAS ABBEY.
Platinotype Printing Competition.

Rev. E. H. Day.

the back of the tissue the land and sky parts respectively. This may save us from the mistake of printing sky and land on one part of the tissue when transferring from one frame to the other. Our land printed tissue is now transferred to the 10×8 frame and sky negative. The sheet of card on the film side of the negative tells us exactly where the piece of tissue must be placed. After the second printing, development takes place in the usual way.

An Alternative Method is to use two pieces of tissue, one for the sky, the other for the land. The sky portion being printed, mounted and developed, is then washed and dried. Meanwhile, the land part (with blocked out sky) is printed on the second piece of tissue. This is now mounted on the same piece of support, and developed in the usual way.

Combination Printing on Carbon.—The reader who has followed our note on sky printing will readily surmise the drift of this paragraph. Suppose we wish to combine a figure with a landscape background. Having determined the position of the figure, take a piece of P.O.P. the size of the larger of the two negatives, if they are not equal. Then make a print with the figure coming in the desired position. Carefully cut out the figure, and allow both pieces of silver paper to darken thoroughly. Then on the face of the landscape negative, fix the figure mask, and its counter mask on the figure negative. It is now easy to follow the previous instructions for getting the tissue in register for the two printings.

There will be some vignetting owing to the thickness of the glass. This may be reduced by printing the negative at the bottom of a box.

If still greater sharpness is required, start again by making a silver print as before, fix this to opaque orange paper with drawing pins: cut through the two papers with a fine pointed sharp knife. The large orange mask is the exact size of the piece of tissue. Now fix the orange mask to *the tissue* by touches of rubber solution at each corner, and print the figure through the hole in the mask. This done, fix the orange mask in the

THE PRACTICAL PHOTOGRAPHER.

hole by rubber solution, and then remove the outer mask and print in the landscape. Remove the mask and rub the face of the tissue with dry rag, when the rubber solution will peel off without affecting the tissue, which is now mounted and developed in the usual way.

Transferring from Matt Opal.—First the opal must be carefully cleaned and freed from grease. It is then dried and well rubbed with “French Chalk” (*i.e.*, powdered talc), and the superfluous powder removed by a wide camel’s hair brush. It is now coated with the following mixture:—

Enamel Collodion.	} Equal parts of each.
Alcohol.	
Ether.	

Holding the plate horizontal with fingers and thumb of left hand, pour on it a pool of the above collodion, then gently tilt the plate this way and that until all parts are coated, care being taken to avoid the coating being spilled, or getting on the under side of the plate. The excess is returned to the bottle by gently lowering one corner into the bottle neck. The plate is tilted various ways to prevent the coating setting in lines.

The coating is allowed to *set* but not *dry*. It will be properly *set* when one can gently touch one corner with the finger tips without wetting the finger. It is now in a jelly-like condition. When dry it is hard and horny. As soon as it is “set” it is placed in a dish of cold water and gently rocked, then removed, and the water poured away and replaced by clean water. At first the coating will have a greasy appearance, but after one or two washing waters this is removed. It is now ready for receiving the print. The exposed tissue is soaked for a few seconds in water, *i.e.*, until it *begins to uncurl* after first curling on immersion, and then gently brought in contact with the opal, both being under water at the time. The two are removed together and covered with a wet piece of thin rubber cloth or soaked parchment paper, and the squeegee gently and firmly applied. Then carefully dry the back of the mounted tissue with blotting paper, and set in a cool airy place for a

few minutes. Proceed to develop in the usual way, but be careful to remove the backing paper of the tissue while the plate is well covered, *i.e.*, use a deep dish for developing. Temperature should be about 100°F: The sooner the backing paper is off the better, provided due care is taken. Then remove the plate and place it on some supporting object, such as a basin standing in the developing dish, and develop by pouring on it warm water from a mug or jug. When developed, apply cold water for a few minutes, and then lay in a dish of alum solution (normal strength). Wash by placing in a dish of cold water which is changed every three or four minutes. Then set up to dry in a cool, airy, dust-free place. The final support is cut a little larger than the print, and rather less than the plate. It is soaked in luke-warm water until it feels pulpy and slimy, but the water must not be warm enough to dissolve the coating. The plate is placed in cold water and the final support put into this, also the two brought together, removed together and gently squeegeed. When *quite* dry, the point of a knife is inserted under one corner of its final support, and with a steady pull the picture is removed from the temporary opal support. The print has a fine matt surface.

Enamel Surface by Double Transfer.—Proceed exactly as above, but using a piece of patent plate, free from scratches, in place of the matt opal glass. The final support should in this case be moderately stout.

Single Transfer to Opal Glass.—The opal glass used for this purpose, has one side smooth and the other finely ground or matt. This matt side is the one to be used for transferring. The opal should be thoroughly cleaned with soapy water and a nail brush, and then thoroughly washed in running water. The print is mounted in the usual way, just as though the opal were a piece of single transfer paper. No substratum or coating preparation is required, as the fine-ground surface of the glass firmly holds the tissue. The print mounted on opal should be under moderate pressure between blotting sheets for about twenty minutes. Do not

THE PRACTICAL PHOTOGRAPHER.

attempt to strip until the pigment is oozing freely along the edges, or the print may be spoiled by being "lifted" from the opal.

Cleaning Opals.—An experiment with opal glass or support may prove a failure. The student will therefore desire to use the same piece of opal for another print. To clean away the adhering print, first use a hard nail brush and hot water. Follow this by *fine* sand and a small piece of stout glass, such as a paper weight, and use this as a muller. The opal must be supported on a solid and flat surface, such as a piece of wood. Considerable pressure may then be used if needful. The muller should be used in a continuous circular stroke.

Transferring Prints to Artist's Canvas.—It is desirable to prepare the canvas for this purpose in the following manner. The canvas received from the artist's colourman is either on a frame or stretcher, or in a roll. In the latter case a piece of the required size is stretched and tacked down to a board. A hot and strong solution of washing soda is applied with a stiff hog-hair brush, or an old nail brush will serve. This will enable us to remove all or nearly all the "surfacing" or "priming." The canvas is now washed in water to remove the soda solution, and allowed to dry. The following coating is prepared:—Water, 16 oz.; cooking gelatine, 2 oz.; sugar, 1 oz.; glycerine, 1 oz. First soak the gelatine in cold water, and when soft bring the mixture to the simmer. Now dissolve 15 gr. of chrome alum in an ounce of hot water, and add this slowly with much stirring to the hot gelatine solution. Apply this mixture to the canvas and rub the first coating well into the material, using a stiff hog-hair brush. When this is dry give a second coating, using a softer brush. When this coating is dry rub over with fine glass paper, and give a third coating. The print is developed on flexible support in the ordinary way. The canvas is put face upwards on a flat and level surface; the print laid on the bottom of a flat dish and a pool of the above mixture poured over it and tilted about until all parts are well covered. Similarly a pool is spread over the face of the canvas. The print is lifted up and brought face to

T
h
e

C
l
e
r
e
s
t
o
r
y,

W
i
n
e
b
e
s
t
e
r.



S
.
G
.
K
i
m
b
e
r.

Fig. 28.



Fig 29

Roses.

E. Seymour.

face with the prepared canvas. The two are lightly squeegeed just enough to remove air bells, and then hung up to dry together. When *thoroughly* dry the temporary support is removed in the usual way.

Alternative Process.—In place of using artist's canvas many workers prefer to use a finer canvas, linen twill sheeting, or ribbed calico. The procedure is the same as just described, except that we may add about 4 oz. of barium sulphate to the coating gelatine coating mixture just quoted. Four coatings are required. Each coating must be dry before the next is applied. If a tinted ground be required we may add fine ground yellow ochre along with the barium sulphate. In either case the canvas should be warmed and the coating mixture kept hot, or it will set before the coating is evenly applied.

Transferring a Print from Flexible Temporary Support to Rigid Final Support: Wood, Ivory, Opal, etc.—The print should be evenly and thoroughly dried; it is then soaked in cold water. The rigid support is levelled; on it a pool of mounting chrome gelatine (see Formulæ, p. 64) is poured and evenly spread. The print is lifted up (face down) by two opposite corners and brought in contact with the coated rigid support, and gently squeegeed to expel air bells. The two are now allowed to dry in a current of air, when stripping is easy. The print should be in the cold water long enough to make it quite limp and flat. When the print is stripped its surface is gently washed with a tuft of cotton wool, moistened with pure benzole, to remove any traces of wax.

Carbon Prints or Silk by Double Transfer.—Develop the print on waxed opal support. Prepare a chrome gelatine solution (p. 64). In this solution while warm, soak the silk for a few minutes. Then lay the fabric on the opal supported print and gently squeegee. Dry thoroughly, and lift at one corner with a knife blade.

Matting Shiny Surface of Carbon Prints.—The dried print is soaked in a bath of methylated spirit and then allowed to dry spontaneously.

THE PRACTICAL PHOTOGRAPHER.

Defects.—The Backing Paper Refuses to Strip.—The tissue has become insoluble. (1) This may be from over-printing. (2) The tissue has been kept too long after sensitizing. (3) It has been kept too long after mounting on the support before development was commenced.

In semi-obstinate cases the print may be laid on a slab of zinc and hot water poured over the back. If the part under the safe edge strips while the other part clings we may suspect over-exposure as the cause. If all parts cling equally, the tissue was probably insoluble before printing was commenced.

Insoluble Tissue.—(1). The use of an acid sensitizing bath. (2) Drying the tissue in a room where gas is being or has been burnt. (3) Drying tissue too slowly. (4) Drying in a damp atmosphere. (5) Storing in a damp place. (6) Exposure to feeble day-light. (7) Keeping too long after sensitizing.

The print refuses to leave the temporary support.—(1) The final support is not thoroughly dry. (2) The temporary support was not properly coated with waxing solution. (3) The final support has been soaked too long or in too warm water and so lost some of its gelatine coating. (4) The temporary support has not been evenly evaporated, *i.e.*, it has been put away too soon after waxing. (5) The final support may not have been soaked long enough. It should feel soft and almost slimy, but not melting.

The Film dissolves and discolours the sensitizing bath.—The solution is too warm. The temperature should not exceed 65° F and is preferably kept to 60° F.

The Gelatine Coating of the Tissue melts or runs during drying.—(1) The drying room is too warm. After the sensitizing bath the tissue should be laid on clean glass and the back dried by pressing with blotting paper. Drying should take place at 60° to 75° F.

Blisters, Frilling or Reticulation may arise from many causes. (1) Touching the face of the tissue with greasy fingers. (2) Air-bells between the tissue

and support. (3) Faulty squeegeeing. (4) Uneven drying after mounting and before development. (5) Soaking the tissue too long before mounting. (6) Using a temporary support before the wax solvents have thoroughly evaporated. (7) The tissue is being used too soon after sensitizing. (8) Frilling may be due to absence of sufficient safe edge—or putting the safe edge on the *film* side of the negative. (9) When developing a print on glass with a collodion substratum and the collodion gets torn or pierced, then the developing water can here get under the collodion film and blisters ensue. (10) Reticulation is liable to follow the use of tissue dried too quickly. (11) The sensitizing bath may contain excess of alkali. (12) Forcing development with very hot water.

Reticulation, *i.e.*, a net-work of fine blisters or frilling, see

Spots, Streaks, etc.—(1) Uneven coating in the manufacture of the tissue. (2) Not properly and evenly drying the back of the tissue after sensitizing. (3) Air bubbles on the tissue when sensitizing. (4) Air bells between the support and tissue. (5) Scum on the sensitizing bath. (6) A light line against a shadow indicates that the final support has not been sufficiently softened by soaking.

Bright Sparkling Spots.—(1) Tiny air bells enclosed between the surface of the tissue and the support. This is more likely to happen with rough than smooth papers, and especially if the support has not been sufficiently well soaked before mounting. (2) Using a frothy substratum or coating for the support. (3) The mounting water was freshly drawn from the tap and contains air.

The Prints are too dark.—(1) Tissue was over-printed. (2) Not developed far enough. (3) Developing water not hot enough. (4) Tissue partly insoluble (q.v.) probably from being kept too long or in a damp place. (5) Print not developed soon enough after printing.

Prints are too Light.—(1) Insufficient printing. (2) Tissue too fresh.

THE PRACTICAL PHOTOGRAPHER.

High-lights too Light, Shadows too Dark.—The negative is too “contrasty.” To mitigate this effect expose the whole of the piece of tissue to diffused light for a few seconds before putting in the printing frame. Use a strong sensitizing bath.

Prints are lacking in contrast.—(1) Negative not contrasty enough. (2) Sensitizing bath too strong. (3) Tissue dried too slowly. (4) Tissue fogged by light or age.

Dark Spots may be due to particles of iron rust from water pipes, kettles, etc., in the developing water. (2) Fine shavings of the tissue produced when it was cut up are apt to cling to the face of the tissue in the sensitizing bath, or get enclosed between the support and the tissue when mounting before development.

Light Spots may be due to air bells imprisoned between the tissue and support when the tissue is being mounted preparatory to developing.

Pressure Marks, i.e., Mottling.—(1) May be due to local dampness in the pressure pads in the printing frame. (2) May be due to uneven drying. (3) Neglect to blot off moisture from the back of the tissue after sensitizing before drying.

Prints are stained yellow.—Due to presence of bichromate. After developing, wash in a couple of changes of cold water and then in the alum bath for 10 or 15 minutes, and again wash in several changes of water.

Dark lines across the Print may arise from local pressure in uneven squeegeeing.

The print leaves the temporary support during development.—(1) Solvents not sufficiently evaporated. (2) The support has been handled with greasy fingers. (3) Developing water too hot.

Light streaky lines may be caused by the corners of one print abraiding another print if two or more are together in one dish.

The tissue does not lie flat in the printing frame.—(1) The tissue has been too quickly or unevenly or excessively dried. Lay the tissue face upwards in a dark but damp atmosphere until it is evenly flexible.



Fig. 30.

THROUGH PARTING MISTS.

T. Linley.



Fig. 31.

Mrs. H. Morgan.

Sister Mephezibah.

The tissue sticks to the negative.—Either the tissue or negative or printing frame pads are damp.

Crystals appear on the tissue on drying.—(1) The sensitizing bath is too strong. (2) The superfluous solution has not been blotted off after sensitizing.

Parts of the picture are not sharp.—The tissue was not in contact with the film owing to buckling or insufficient pressure.

Remedies for excessive Printing.—(1) Hotter water. (2) Soapy water. (3) The addition of chloride of lime, sodium hypochlorite chlorine water, peroxide of hydrogen, ammonium sulphocyanide, soda carbonate, caustic soda, etc., to the developing bath.

Prints on collodionized glass refuse to strip from the glass.—The glass has not been properly cleaned and waxed, or the wax coating has all been polished off the glass.

The Safe-Edge may be on either the film or glass side of the negative, and most experienced workers say that the glass side is the better place of the two. It gives a slightly softened margin, and this reduces the chance of frilling along the line. The safe-edge may be made of any opaque material such as tinfoil, card, paper or pigment. A sheet of orange paper may be gummed, dried, and cut up into strips, or one may conveniently use lantern-slide binding strips, or black varnish, or vermilion, and gum water, etc. Post-card or lantern-slide masks may be found useful occasionally.

Retouching or Spotting Carbon Prints.—Take a small piece of unsensitized tissue of the same colour as used for the picture. Soak in warm water until it *begins* to melt. Then with a blunt knife scrape away a little heap of the coating, add a drop of strong gum water and one or two drops of ten per cent. potass bichromate solution. Mix well with brush or palette knife and apply. When dry expose to daylight for an hour or two. N.B.—The exposure to daylight will very slightly darken the spotting, for which allowance should be made.

THE PRACTICAL PHOTOGRAPHER.

Coating Wood with Substratum.—The wood must first be freed from paint, varnish, grease, etc. It is then given a slightly matt surface by rubbing well with fine glass paper. The first one or two coatings will sink into the wood, when a third must be applied if necessary. A fourth may be required with very porous woods.

Mounting carbon prints presents no difficulty. After trimming in a dry state the prints are put in cold water, then laid face down on a sheet of glass, the back dried with blotting paper and then covered with starch, dextrine, or paste, and then placed in position on the mount. The face of the print should be covered with a piece of parchmentized paper and gently rubbed with roller squeegee. It must be remembered that a carbon picture when wet is a delicate thing, easily damaged by careless rubbing. But with *reasonable* care there is no fear of injury.

A carbon print has the advantage over a silver print, inasmuch as it will not be injured by the use of stale starch, gum or paste.

Variations in Sensitizing.—For negatives of moderately vigorous contrast it is recommended to use a “one-in-twenty” bichromate solution. For thin negatives this may conveniently be diluted with an equal quantity of water, thus making it equivalent to one part of the bichromate salt in forty parts of water. Tissue sensitized in a weak bath gives a slow-printing tissue which yields increased contrasts, and therefore suitable for obtaining bright prints from poor contrast negatives.

Frothing in the Developing Tank.—It is sometimes found that after several prints have been developed in the same lot of water the mixture begins to have an inconvenient quantity of froth and bubbles. These may be almost instantly removed by dabbling a bit of common washing soap in the water.

The Sensitizing Bath may be used over and over again, but it is always desirable to filter it through a plug of cotton wool on returning it to the stock bottle. However carefully one may cut one's tissue there are always some tiny shreds which find their way into the sensitizing bath. If these are allowed

to remain in the bath, they induce deterioration of the bath, and also give rise to spots, etc., by clinging to a sensitized piece of tissue.

Keeping Tissue.—Tissue sensitized in a bath converted from orange to yellow by the addition of ammonia will keep in good condition longer than if sensitized in the plain bichromate solution. An acid sensitizing bath gives a more sensitive tissue, but it more readily becomes insoluble, and therefore is not to be recommended.

Sensitizing.—Before immersing a piece of tissue in the sensitizing bath it is a good plan to rub both back and front with a clean duster, so as to remove any dust or clinging paper shreds.

Time in the Sensitizing Bath.—A cheap sand egg-timer will be found useful. This enables one to give approximately the same length of time for each piece of tissue. Three minutes' immersion in a "one-in-thirty" bath will be found a generally useful strength and time.

Sensitizing Hint.—It is of great importance to avoid air-bells clinging to the back or front of the tissue. Having immersed the tissue in the bath face downwards, and pressed it well under the surface of the solution, then remove it from the bath and drag it over the edge of the dish. This will remove the air-bells, which cling more obstinately to the paper side than they do to the coated side.

Hints for Drying Sensitized Tissue.—In order to ensure good contact the tissue should be dried with a smooth surface. A piece of glass is well cleaned, dried, dusted with French chalk, and polished with a silk duster. The sensitized tissue is squeegeed down to this, the back well dried with blotting paper, and the tissue allowed to dry. When *quite* dry it will easily strip, and then has a smooth surface. If we coat one side of our glass sheet with black varnish, or use a sheet of ferrotype metal, we can then dry our tissue in very subdued daylight, *e.g.*, such as a basement passage. The ferrotype sheets may be punched with a hole near one corner and then hung on a nail in the wall. N.B.—Very often the tissue will strip itself and fall off the sheet. This contingency must be duly provided for.

THE PRACTICAL PHOTOGRAPHER.

Duration of Time when Drying Tissue.—Experience shows that if drying takes more than, say, eight hours, the tissue, if not already insoluble, will quickly become so. On the other hand, rapid drying usually means drying in irregular patches when the tissue is unevenly sensitive. The practical limits of time may be put at four to eight hours as minimum and maximum respectively.

Drying Tissue.—Each piece of sensitized tissue may, by a couple of dark-room pins or steel pins with black glass heads, be conveniently attached to the front edge of a shelf, or to a long lath suspended across the upper part of the room.

Testing Tissue.—Before beginning to print on tissue that has been sensitized more than a day or so, it is just as well to cut off a tiny scrap and put it in a cupful of water at about 105° F. to see if it is quite soluble.



Hints, Notes and Formulæ.

Compiled by THE EDITOR.

Sensitizing Baths.

- A. For weak contrast flat negatives. Water, 50 ozs.; potass bichromate, 1 oz.
- B. For moderate contrast negatives. Water, 30 ozs.; potass bichromate, 1 oz.
- C. For hard, vigorous contrast negatives. Water, 20 ozs.; potass bichromate, 1 oz.

Alum Bath. Water, 20 ozs.; potash alum, 1 oz. Immersion for ten minutes will be found sufficient.

Permanent support may be made by soaking moderately soft paper in dilute celluloid varnish.

Single Transfer Paper. Soak white sized paper in a dilute solution of bleached lac, *or* in Water, 30 parts; borax, 1 part; bleached lac, 3 parts—or coat with acid proof varnish.

Thin Collodion. Of ordinary enamel collodion, ether and alcohol take equal parts and mix.

THORNTON-PICKARD

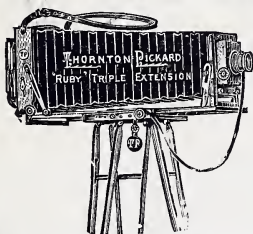
CAMERAS & SHUTTERS.

"ROYAL RUBY TRIPLE EXTENSION."

Extension

($\frac{1}{2}$ -plate size).

22 ins.



Short

Focus,

4 ins.

KING OF CAMERAS.

A Superb and Perfect Camera, suitable for every class of work:

Architectural, Engineering, Mechanical, Landscape, Telephoto, Portrait or Stereoscopic Photography.

ALL MOVEMENTS

MECHANICALLY ADJUSTED.

SPECIFICATION:—

Camera beautifully constructed of the finest selected mahogany, and highly-finished in the best possible manner, with all modern movements, mechanically adjusted, including:

Swing Back, Triple Rack and Pinion.

Rising and Falling Front, actuated by Rack and Pinion.

Cross Front, also with Rack and Pinion.

Back Racks forward for Wide-Angle Work.

Long Extension, 22 ins.; Short Focus, 4 ins.

"Royal Ruby" Outfit, with Triple Extension Camera, Turntable, Three-fold Tripod, Plate Holder, Time and Inst. Shutter, with Speed Indicator and Time Exposure Valve, $\frac{1}{2}$ -plate size,

£11 . 0 . 0.

"Royal Ruby" Outfit as above, but with Double Extension Camera only,

£9 . 18 . 0.

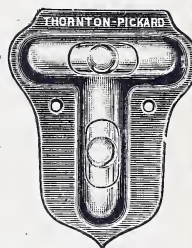
Complete Illustrated Catalogue Post-Free.

THORNTON-PICKARD MAN'F'G CO., LTD.,
ALTRINCHAM.

PHOTOGRAPHIC SUNDRIES.

SPIRIT LEVEL

(Registered Pattern).



Supplied complete in box with screws.

Price
2/-

Postage, 1d.

Indispensable when Photographing Architectural Subjects.

This form of Spirit Level (usually termed a **T-level**) will be found most convenient. It is two levels in one, and by its use the Camera can be levelled in both directions without difficulty.

EXPOSURE RECORDER.



BEFORE EXPOSURE

PATENT)

PRICE

6d.

EACH.



AFTER EXPOSURE

Box of Six, 3/- Postage, 1d.

An Extremely Practical and Useful Addition to Slides and Plate Holders.

Easily fitted to most slides. Shows at a glance which plates have been exposed.

Prevents two pictures being taken on one plate.

Recorders are fitted to Slides sent to us at a cost of 3d. extra per Recorder.

Special Sundries Circular Post-free.

ADMIT OF NO COMPARISON

THE PRACTICAL PHOTOGRAPHER.

Waxing solution for temporary support.

1. A.—English bees' wax (not the paraffin substitute), 30 grains ; benzol, 10 ozs.
B.—Powdered resin, 2 drams ; turpentine, 10 ozs. When the wax and resin have dissolved, then mix A. and B.
2. Ether, 1 oz. ; powdered resin, 18 grs. ; yellow bees' wax, 6 grs. First melt the wax, then stir in the powdered resin, finally add the ether.
3. Yellow bees' wax, 10 grs. ; powdered resin, 10 grs. ; turpentine, 1 oz.

Chrome Gelatine for Mounting.

- A. Cold water, 20 ozs. ; Nelson's No. 1 gelatine, 1 oz. Soak for one hour and then slowly heat until the mixture begins to simmer.
- B. Hot water, 2 ozs. ; chrome alum, 12 grains. Add B. to A. very *slowly*, vigorously stirring all the time.

Varnish for Carbon Prints. Benzole, 100 parts ; Gum Damar, 10 parts.

Sizing Carbon Prints for Oil Painting. Dissolve 20 grains of isinglass in an ounce of water, strain through fine muslin and add (slowly, a little at a time—stirring all the time) one ounce of methylated spirit. Coat the print, allow to dry and then give a second coating.

Substratum for Transparencies.

1. Water, 20 ozs. ; gelatine (Nelson's No. 1), 1 oz. Add enough 5 per cent. solution of potass bichromate to give a pale sherry or straw colour.
2. In 4 ozs. water, dissolve 250 grains of Nelson's No. 1 gelatine. Add slowly with stirring a 5 per cent. solution of chrome alum until the gelatine is coagulated. Drain on fine muslin and then dissolve in an ounce of glacial acetic acid on a water bath. Then add very slowly 16 ozs. of methylated spirit.

Substratum for Wood. Water, 15 ozs. ; gelatine, $1\frac{1}{2}$ oz. ; Sugar, 1 oz. Glycerine, $\frac{1}{2}$ oz.—Chrome alum, 10 grains previously dissolved in water 1 oz.

Substratum for Carbon Transparencies. Water, 10 ozs. gelatine, (Nelson's No. 1), 90 grs. ; potass bichromate, 15 grs.

Substratum for Glass.

- A. Water, 20 ozs. ; gelatine, 3 grs.
- B. Chrome alum, 12 grs. ; water, 2 ozs. Add B. to A. slowly, then add enough acetic acid, drop by drop, to render the mixture fluid.

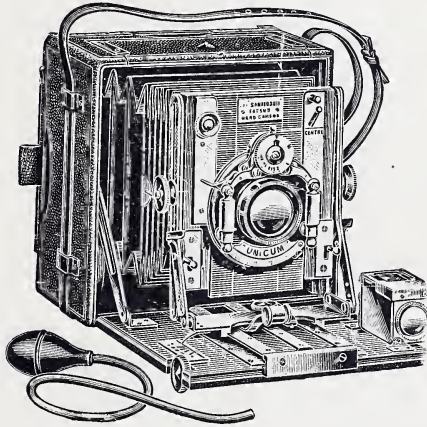
Substratum for Drawing Paper. Water, 20 ozs. ; gelatine, 1 oz. ; Formalin (40 per cent.) 40 drops.

Glass as a temporary support is strongly recommended by an expert continental worker. Take white wax, 2 parts, add ether, 50 parts and alcohol, 50 parts. Use this as a waxing solution. When the solvents are evaporated, place the waxed plate in a 5 per cent. bath of chrome alum. This destroys the stickiness of the wax.

Continuing Action. Precise figures cannot be given for the degree of continuing action, but it has been stated that a print kept four hours in a moderately damp cellar is equivalent to double printing in four hours, and trebled in eight hours, quadrupled in twelve hours, and so on.

THE MOST EXPENSIVE CAMERA IN THE WORLD

Could not be better than the "Sanderson." Human ingenuity and mechanical skill have been lavished on its construction. Amateur Photographers from every country under the sun have testified to its amazing powers, and its wonderful



simplicity. The "Sanderson" goes everywhere, and takes everything—nothing comes amiss. The simplest snap-shot on a sea-side shore, or the intricacies of telephotographic architecture—the "Sanderson" is ready for either. Does your ordinary camera always do what you want it to? Are there never any occasions when you wish for the "Sanderson" swing front, the "Sanderson," long extension, the "Sanderson" falling baseboard, or any of the other world-famed "Sanderson" movements? Why potter along all through the year with your present inadequate outfit? Get a Sanderson booklet, and realise what you are missing. DON'T LEAVE IT TILL ANOTHER DAY: WRITE IMMEDIATELY TO HOUGHTONS LIMITED, THE SANDERSON SPECIALISTS, 88-9, HIGH HOLBORN, W.C. YOU WILL BUY THE CAMERA WHEN YOU HAVE READ THE BOOK.

THE PRACTICAL PHOTOGRAPHER.

Messrs. Wellington & Ward's (Elstree, Herts.) carbon tissues are almost too well known to need mention. But it does not seem to be sufficiently generally known that they make somewhat a speciality of "Enammo Transparency Tissue" (extra fine). In the words of an esteemed colleague and expert the results hereby obtained are "*simply a revelation.*" In addition to thirteen delightful colours of tissue they make several transfer papers, including a Hand-made Rough Drawing (especially valuable for exhibition work) and also issue a booklet of instructions giving ample directions in simple and concise language. Every carbon worker should send for this without delay.

From the Autotype Company (74, New Oxford Street) we have received a "Trial Set of Carbon Printing Materials." This consists of a neat card box—about the same size as that used for a dozen whole-plate-size dry plates. This contains a dozen half-plate-size pieces of ready sensitized carbon tissue, a dozen sheets of single transfer paper, a squeegee, an actinometer, supply of safe edge masks, a package of alum, and a little manual or booklet of instructions. This outfit for half-plate size costs 3/6, or for quarter-plate size only half a crown, and for these indisputably modest sums a beginner may reasonably hope, with moderate care, to obtain, let us say, ten satisfactory carbon pictures out of his first dozen pieces of tissue.

These trial sets are just the thing to put into the hands of anyone who has not seen a demonstration of or made any attempt at Carbon printing. We are glad to have this opportunity of mentioning the fact that this company publish a small pamphlet dealing with the special features connected with the working of the carbon process in hot climates. This tract is from the pen of General Waterhouse, whose name is ample guarantee of its thoroughness and reliability. Probably no other person has had such a wide and varied experience of the subject dealt with in this pamphlet. Doubtless many of our foreign readers will be glad to know of this pamphlet, for which application should be made to the Autotype Company.

Messrs. Elliott & Sons (Barnet) remind us that in their £500 cash prize competition (closing Dec. 31st, 1904) classes 13 and 17 are for prints made with "Barnet" Carbon Tissue. This firm have long been making tissue of very fine quality and in a very varied and choice range of beautiful colours. The firm also issue a concise little pamphlet of practical instructions, which in simple and explicit language tells the beginner just exactly what he needs to know without bewildering him with too much detail. Messrs. Elliott have generously promised to send a copy of this excellent booklet *gratis* to any of our readers who will send their address and mention *The Practical Photographer*. An offer like this should be seized at once by any one who wants to get the best value out of his negatives by printing them by the Carbon process.

Messrs. Illingworth (Willesden Junction, N.W.) are so widely known as manufacturers of carbon tissues, supports, and all other things useful in the working of this fascinating process, that it seems almost superfluous to do anything more than mention their names. The beginner, however, may be glad to know that they are supplying specimen sets of small prints illustrating the various *colours* of tissue made by them. Among these he may find several beautiful shades which appreciably differ from the colours by other manufacturers. The question of colour is one of first importance to the carbon work, and it may well happen that the right choice of a certain shade of brown, sepia, etc., just makes all the difference between a complete success and an ordinary result. This firm also undertake printing in carbon from customers' negatives.

Messrs. Watson & Sons (High Holborn) desire us to tell our readers that the Argus Reflex Camera (half-plate size) now only measures $9\frac{1}{4} \times 7 \times 7\frac{3}{4}$ inches over all projections and weighs $5\frac{1}{2}$ lbs. It will be at once recognised that this is a remarkably light and compact camera, and as it costs only ten guineas (three dark slides included) it is also a bargain as well. One need hardly say that the name Watson & Sons is a guarantee of first-class quality.

Messrs. Illingworth have kindly sent us a copy of "Carbon Photography Made Easy," 1/- net—an excellent manual, practical, concise and comprehensive.

Messrs. Watson & Sons are now supplying the antinous shutter release with a looped end, so that it may be instantly applied to any form of shutter that is released by a finger pressure applied to a trigger. As this form of shutter is one of the most popular at the present time, we feel confident that this antinous release will be widely appreciated and have a large sale.

CARBON₂

Photography.

ROTARY CARBON TISSUES.

IN AN UNEQUALLED SELECTION OF 20 Colours.

AND STRIPPING FILM, 12 Colours.

Write for Handbook of Instructions and full particulars.

Three-Colour

Photography.

ROTARY STRIPPING PIGMENT FILM.

THE SIMPLEST SYSTEM,
YIELDING THE MOST CORRECT RESULTS.

Descriptive Handbook (in the press) free on application.

For Printing Holiday Negatives use the Best Papers,

i.e., **ROTOGRAPH**
BROMIDE PAPER.

($\frac{1}{4}$ -pl., 12 sheets, 6d.)

ROTOX
GASLIGHT PAPER.

($\frac{1}{4}$ -pl., 12 sheets, 6d.)

POPULAR PRICES.

AND SECURE THE BEST RESULTS.

OF ALL DEALERS, OR

The ROTARY Photographic Co., Ltd.,

12, NEW UNION STREET,

Works: West Drayton, Middlesex.

MOORFIELDS, LONDON, E.C.

Telegrams: "Rotatoria, London."

Telephone: 1109 London Wall.

THE PRACTICAL PHOTOGRAPHER.

An Improved Actinometer.—The Portable Studio Manufacturing Co., Stourbridge, send us a specimen of their "Special Akuret" print meter. The coloured guide strips instead of being of one even tone are now graduated, rendering the working gradations finer still, and permitting even the most delicate sunnings down to be accomplished with an ease and certainty hitherto unapproachable. The numbered card is black instead of white as in the older instrument. A spring clip keeps the meter tightly closed. The frame is stained and polished. These four improvements will doubtless tend still further to popularise this valuable aid of the printing room. The size (comparable to a rather thin quarter-plate printing frame) and general design remain practically the same as before. The scale of tints or densities extends from 1 to 30. Readers of this number of *The Practical Photographer* will not need to be again told how needful is a good actinometer when carbon printing.

From Messrs. Wm. Knapp (Halle-a S).—We have received the "Internationale Photographische Ausstellungen (8th Salon of the Paris Photo Club). This quarto volume contains about forty excellent reproductions of pictures by well-known workers. Among these we find Chas. Job, F. H. Evans, W. R. Bland, Alex. Keighley (whose name has unkindly been printed as "Kalex Eighley"), several American names, and of course many Continental workers. Prefatory pages are contributed by Franz Goerke and Richard Stettiner, and Maurice Bucquet deals with the Paris show in detail. The entire publication reflects very great credit on all concerned; and while we personally should have preferred to see some of the pictures in inks other than black, yet the harmonious effect of this one ink cannot be denied. The book has only to be seen in order to be greatly admired.

Messrs. Houghtons, Ltd. (High Holborn), have sent us a specimen of their "Standa Developing Tank." By means of a changing bag, half a dozen pairs of exposed plates (or films), are put back to back in a grooved metal box, which has a light-tight lid. This box is then lowered into a similar shaped but slightly larger "tank," which has previously been filled with developing solution. The developer finds its way into the inner (grooved) box through a light trapped opening in the bottom. Thus, development may be carried on in any ordinary room, and the dark-room entirely dispensed with. After development, the plates may be rinsed, and then fixed in the same way that they have been developed. This is just the kind of apparatus one requires when developing a few trial plates in the hotel bedroom when on tour.

From Messrs. Moll & Jonas (27, Chancery Lane), we have received a sample package of Pala Paper. This is slow contact-printing paper for gaslight development. It is made in six varieties—white, blue, pink, matt, glossy, card, etc. Also a sample of G.S. Platino bromide paper for contact printing and enlarging. This is made in six grades, half matt and 3 grades extra matt. Each envelope contains a leaflet of well-arranged explicit instructions. Our preliminary trials of both these papers have been so satisfactory that we hope to follow them up by a series of toning and other experiments as soon as time permits. Meanwhile we can confidently recommend our readers who may not already have made final choice of printing paper to give these two a "fair field and no favour." We specially commend the "*gros grain*" surface to the notice of pictorial workers. It has only to be seen to be admired and appreciated.

The Photochrome Company send us a neat folio containing twelve prints reproduced from originals by Dr. Chas. Grindrod, accompanied by a sympathetic introductory note by Mr. H. Snowden Ward. Several of these pictures are old friends, which have already a warm corner in our affections; others we have not seen before, and of them all we may say that they are very welcome additions to our collection. Dr. Grindrod quite wisely does not affect any extremes of subject or treatment, but is catholic in his sympathies and unaffected in his craftsmanship, dealing with each picture on its merits without regard to tradition or fashion. Hence we find these pictures quietly growing on us and inviting renewed examination. We offer him our thanks and congratulations, and feel sure that wherever this folio is seen its contents will be greatly appreciated.

Messrs. Thornton Pickard have sent us a handy little leaflet price list of several useful things, such as spirit levels, plumb indicators, exposure recorders, negative holders for enlarging, folding tripod screw, telephoto lens support, etc., and a lot of other handy little things which tend to help a careful worker to make good work better still. The man who wants to keep abreast with the times should write to the firm (T. P. & Co., Altrincham), for a copy of this useful little list.

When you were a child did you ever use coloured 'transfers'?

J.S.

Well, Carbon prints are produced in very much the same way.

No chemicals are necessary—Hot Water only for development and fixing.

TRANSFER on to any surface. Transfer Papers are supplied of all kinds: White, toned, smooth, matt or rough, at your wish. You can also, by the Carbon Process, choose just what coloured prints you desire. No Toning is needed—only Hot Water.

Write for the booklet "A Chat on Carbon Work," which gives every information on this charming process, sent free, then get a 5/- "Carbon Outfit," which contains everything necessary to make Carbon prints. YOU WILL NEVER REGRET IT.



Thomas Illingworth & Co.

Limited,

THE PHOTO WORKS,
WILLESDEN JUNCTION,
LONDON, N.W.

Platinotype Competition and Prints for Criticism.

*Will competitors and others please kindly note our rule to the effect that when prints are to be returned stamp must be sent **WITH THE PRINTS**—not afterwards.*

Will contributors to our various competitions kindly refrain from sending under one cover prints for different competitions? This not only gives us considerable trouble, but evolves the risk of the various pictures not being properly entered for the competition for which they are intended. It is far better for all concerned to send each lot of prints in separate parcels.

Dr. A. T. Lakin (Moston).—"Poppies." We have nothing but praise for this entirely dainty and clever flower study. The technical quality, which we hardly hope to retain in our reproduction, is excellent, and the trimming, mounting, titling, etc., are all in harmony with the general good quality of the print. We hope our praise will tend to make the author dissatisfied with his work so that he may give us something still better ere long. The details of production may be interesting:—Barnet Orthochromatic; backed; medium three times screen; diffused light; $f/16$; exposure, 36 seconds; orange and white flowers, four feet from window; Rodinal developer; no after-treatment. Fig. 26.

J. R. Sandilands (Edinburgh).—"Cramond Brig." The original now before us is a quite charming bit of work and has many good points both technical and pictorial. We are reluctant to find fault with such a dainty bit of work, but "duty compels." The weak point is the patchy distribution of light and shade. Two patches of light on the "brig," two in the water and two in the sky. By slightly sunning down both lights in the water a vast improvement might be effected. We also incline to think that a slightly less dark print would have more harmonious quality. Fig. 24.

E. Hoppe (Strawberry Hill).—"A Portrait." This also is very nearly quite good, yet falls short by reason of undue accentuation of the deepest shadows, which have lost value. Thus the shadow on the side of the nose and side of the face is practically as black as the coat. Nevertheless, the pose of the head, hands, and figure are all unconventional and free and correspondingly interesting. The concentration of the chief light on the forehead and the texture rendering of the hair are particularly noteworthy. Fig. 8.

Dr. T. Taylor Smith (Halifax).—"The Smith." This is very nearly being a good thing, but errs on the side of over-darkness in the lower portion of the scale of tones. That is to say, many of the darker portions which should have been shown as of different tone value are practically equally black. This in turn means a loss of scale due very probably to slight under-exposure. The camera was a little too high up from the ground, which, in consequence, seems to rise up in an uncomfortable manner. The movement of the smoke is well suggested, but the man should be attending to his work and not listening to what the photographer is saying. Fig. 11.

Rev. E. H. Day (Abbey Cwmhir).—"Buildwas Abbey." A piece of excellent technical work. The chief fault is a slight general weakness of image. The stone of the building hardly seems quite solid. The print should have been exposed a few seconds longer and then developed in a rather warmer bath. The "quality" of this print is exactly what one wants in a flower study, but not quite vigorous enough for "sermons on stones." The point of view has been chosen with considerable taste, and the characteristics of the Norman work are well displayed. Fig. 27.

S. G. Kimber (Southampton).—"The Clerestory, Winchester." A glance will suffice to show the spectator that we here have work which is as interesting as it is unconventional. From the technical side the subject is one presenting considerable difficulties of strong light and shade contrasts and great depth of focal planes—the latter requiring a small stop, the former a generous exposure. From the pictorial aspect the print presents contrasts which might have been advantageously reduced, and the rather large patch of marginal light to our left is not all one could wish. The camera might also have been nearer the ground, and so reduced the effect of an uprising distance. Nevertheless the picture is one which reflects very great credit on its producer. Fig. 28.

THE ALDIS F/7.7

EXACT SIZE



ANASTIGMAT

WRITE FOR OUR LATEST ILLUSTRATED LIST POST-FREE FROM—

ALDIS BROS., Old Grange Rd., Sparkhill, B'ham.

PHOTOGRAPHIC CHEMICALS, PAPERS, PLATES, &c. Latest Introductions.

"ORTHOCHROM T."—A new Sensitizing DYE, which gives to the Plates a high sensitiveness for Green, Yellow, Orange, and Red. No Fog.

"PINACHROM."

Full particulars and prices on application.

"PINAKOL SALT N."—

Replaces the Alkali used with organic developers.

17, PHILPOT LANE,
LONDON, E.C.

FUERST Bros.



COAL TAR COLOURS

for Photography.

Sole Agents for "PINAKOL P."

—A Rapid Developing Solution, containing neither Caustic nor Carbonated Alkalies. Does not stain the fingers.

FLASHAXE, GOLDAXE, SENSAXE, PYRAXE, SOLARAXE, and all other Axe Brand Specialities.

HAUFF'S DEVELOPERS. Adurol, Metol, Amidol, Glycin, Ortol, etc. Full Particulars and Price Lists on Application.

Telegrams: "FUERST, LONDON."

Telephone Nos.: 1030 Avenue. 5020 Central.

The ADON

(REGISTERED.)

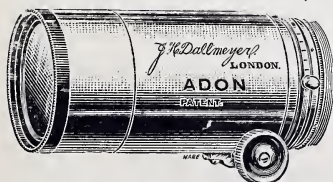
**DALLMEYER'S
NEW
TELEPHOTO LENS.**

*Can be used in front of an ordinary lens.
Can be used alone.*

**The Best Lens for
PICTORIAL EFFECTS.**

Price
£3 10 0 nett.

Send for Illustrated
Booklet.



J. H. DALLMEYER, Ltd., 25, Newman St., London, W.

XV.

Kindly mention "The Practical Photographer."

THE PRACTICAL PHOTOGRAPHER.

E. Seymour (Watford).—"Roses." Our congratulations on a well-won award. The frail daintiness of the blossoms admirably rendered. Technical qualities excellent. Arrangement graceful and decorative, with a wise reticence in not showing too much. Overcrowding is one of the commonest of faults in flower photography. Readers must always please make liberal allowance for the inevitable difference between an ink reproduction and the original photograph. Fig. 29.

Miss M. Bruce (Camden).—"Sunshine and Snow." This is another of those interesting experiments which are so very near being a complete success, and yet just miss by a mere shave. The general effect of this picture and mounting is excellent in every way except the blank patch of sky, the one unfortunate note which makes one feel that with such white freshly-fallen snow one could not have such a light sky. It is well and helpful to notice that in winter one often finds the sky near the horizon a shade darker than in the upper parts, while in summer the opposite is far more likely to be the case. By a little very careful sky-shading and the use of a rough paper to soften the distant dark parts, a quite charming print might be made from this negative. We shall soon be at that time of the year when scenes of this kind *may* be engaging our attention. Fig. 25.

Miss Sylvia Cardwell (Eastbourne).—"Aimée." This interesting portrait study, by one of our esteemed and promising competitors, forms an instructive contrast to its companion, each helping to learn something from the other. The chin is a little too forward, and the background not quite enough to relieve and give full force to the half-tones of the face and figure. The mass of hair consequently comes somewhat solid and dark. The mounting is particularly noticeable because it is so very quiet and *unnoticeable* until one pays special attention to it. Fig. 19.

Mrs. Morgan (Westgate).—"Sister Hephzibah." A striking and strong portrait, which has good and bad points side by side. The print, which is of goodly size, has faultily been put behind a cut-out mount with very conspicuous white bevel edges—here purposely omitted. The poise and turn of the head are good, and the lighting broad. The subdued light on the collar is ably dealt with. The shadows on the face are all a little too pronounced. The patch of background showing just below the bow under the chin, requires considerably subduing. A very much rougher paper would have given more transparency to the shadows. This print received a certificate in our recent Junior Salon. Fig. 31.

R. Barrett (Nelson).—"Decorative Flower Study." This is one of the pictures which won a Bronze Plaque in our last Junior Salon. The simplicity of the subject, and its graceful and natural arrangement, are particularly praiseworthy. The delicate rendering of the petals is also a noteworthy point. The author is to be congratulated on having turned out a very creditable result. The winning print measures 10 inches in length, and was enlarged on to Kodak Royal Bromide from a half-plate negative. Fig. 23.

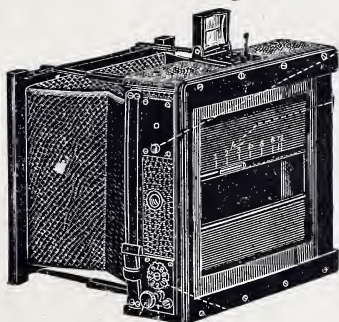
R. D. Percival (Kensington).—"A Wind-swept Moor." This picture has been before us for some considerable time, waiting a favourable opportunity for its reproduction. The picture shows the value of some fairly well-defined objects (rocks, trees, etc.) in the foreground. The various planes—foreground, middle and extreme distance—recede one behind and beyond the other in an agreeable manner. The clouds are admirably suggested without being too conspicuous. Fig. 10.

W. Milburn (Sunderland).—"Evening on the Wear." This is a picture which we scarcely hope to reproduce without a considerable loss of general quality. It is also a subject that requires a certain size and ample mount to give it full force. The fact that the judges gave it one of the three silver medals in our recent Junior Salon shows they thought it of exceptional pictorial quality. Our fault with it is that the sky part, *i.e.*, sunlight and cloud, are just a little too strongly contrasted, so much so that the clouds look a little too solid. The figures have wisely been well subdued, and the detail of the shipping also treated with appropriate breadth and freedom. Fig. 22.

A. H. Avery (Brighton).—"Homewards by the Evening Light." In this example we have some quite excellent portions, but—there is always a "but" in every photograph—still there are parts which one could easily imagine changed for the better. The upper left corner is a trifle too dark. The near part of the water requires a little more contrast and vigour, so as to make the further water look distant by force of comparison. The group of men and boat come just a wee bit too solid and dark, and the distant light on the sea

GOERZ-ANSCHÜTZ

Folding Camera



**NEW
MODEL
1904**

**Light.
Compact.
Simple
in
Use.**

Gives exposures from $\frac{1}{10000}$ sec. to 5 secs.
For plates and films.

Ensures satisfactory negatives when other Cameras fail.

Send for Illustrated Booklet No. 70 to

C. P. GOERZ,

1 to 6, HOLBORN CIRCUS, E.C.



Taken in $\frac{1}{10000}$ th second.

ENLARGING IS A PLEASURE if you use the SOUTHPORT Patent TABLE & SCREEN.

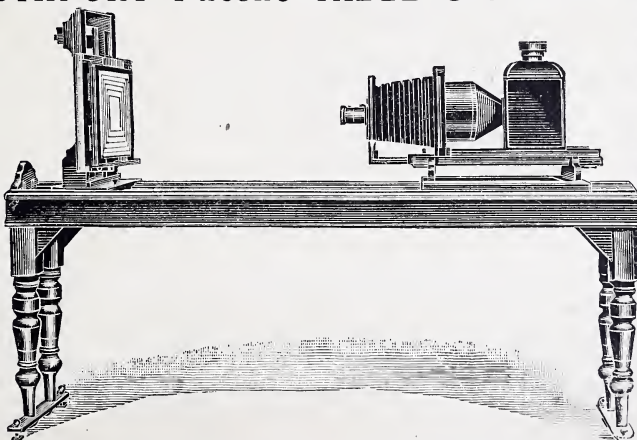
**Rapid in
Use.**

**Easy to
Work.**

**Accuracy
Ensured.**

As
supplied
to the
Leading
Societies.

Equally
Useful
for
Daylight
Enlarging.



The Screen, with Universal Movements, Top Rails and Lantern Carriage	£3 3 0
Folding Table and Easel complete for Enlarging, from $\frac{1}{4}$ to 15×12 , as illustration, but without Lantern	5 5 0
Complete Set of Carriers for Making Enlarged Negatives	0 10 6

To be had of all Dealers, or direct from the Sole Manufacturers—

SANDERS & CROWHURST, 71, Shaftesbury Avenue,
LONDON, W.

THE PRACTICAL PHOTOGRAPHER.

just under the setting sun might be a little more emphasised than it is. Yet, all things considered, it is a highly creditable piece of careful work. May, 6 p.m.; dull; $f/11$; exposure, 1-15th sec. Fig. 20.

J. Linley (Stamford Hill).—"Through Parting Mists." Our sincere congratulations upon a very charming bit of poetic landscape. The picture "hangs together," as the painters say, in a very satisfactory manner. Our only fault is that the line of ground mist is just a wee bit too marked. We hope to keep this well in hand in the reproduction. Fig. 30.

W. H. Rundle (Tamworth).—"The Blacksmith." This is an instance of a very good try at a difficult but promising subject. The pose and lighting of the figure are praiseworthy, and many parts of the picture are effectively rendered. On the other hand, there are rather too many small and scattered high-lights, which are a little disturbing and opposed to that valuable quality called "breadth." Again, there are several patches of dark which are too evenly dark; not that one wants detail in every shadow, but that one does not want too many or too large patches of the strongest dark the process will yield. Of course, quiet and moderately dark portions are often the most valuable parts of a picture, such as those in front of the figure's face and the lower part of his body. But one does not want large patches of the "darkest possible." Fig. 21.

A. B. (Bradford).—Your work is of a distinctly promising and tasteful character. The sky and cloud part is better than the average, but some of your shadow portions are rather too heavy. Your mounting is not quite satisfactory and does not show your picture to best advantage. Try another print, slightly tone with hypo-alum and mount on a dark greenish-brown colour, having previously pasted your mounting paper down to stout card to prevent it cockling. When developing a negative intended for enlarging keep the density contrasts rather less than you have done in this case. The best negative for enlarging should be rather too thin and flat for contact printing.

E. R. (Wilmslow).—You were very near being a prize winner with "At the Casement." You might repeat this and aim at getting just a *little* more light and shade difference in the lower part of your picture. Perhaps a large reflector (such as a sheet) would help you. The lettering of the title is not quite as neat as one could desire. The trimming of the print is also a little raggy at the edges. Your other print is not so good. Here the light and shade contrasts are too hard, pointing towards serious under-exposure. For indoor figure studies you will find you get a more harmonious result on a cloudy day rather than one with bright sun.

Mrs. P. M. (Kirkby Stephen).—The two prints of girl with spinning wheel are not nearly so good as the third (retained). In all cases you were a little too near your sitter, also a little too high up above the ground, hence the strongly marked somewhat unpleasant perspective effect of the porch and floor. Also your prints point in the direction of negatives having over strong contrasts. Instead of 1-15 sec. with $f/16$ try *one* second and dilute your developer with an equal quantity of water, aiming at softness in the negative. The sleeping girl does not look asleep. It was a mistake to turn her face towards the camera.

R. S. B. (Darlington).—The borders round 1 and 2 are not quite satisfactory. For good effect in this style one must get exact register. This is only a matter of taking great care and cutting your masks exact and true with a straight edge and sharp knife. 1.—Ground portion rather flat, *i.e.*, monotonous in light and shade effects. Indeed the picture generally is rather too nearly one even shade. Point of view is tastefully chosen. 2. This is quite the best composition and is very nice indeed except for the border, which is faulty. You might advantageously trim away all the border and put on a dark brownish-green mount. 3.—The water and sky are too much like blank paper for satisfactory effect, and the tree branch is rather too sprawly for good pictorial effect.

F. G. P. (Crumlin).—Please be careful to put your name on the back of each print or you will run great risk of not having them returned. 1.—Water part quite excellent. Cloud part technically good but yet it does not seem to harmonise with the rest of the picture. As a composition the picture lacks a focus of interest. It is too "all-over-ish." 2.—The light line round the print is of very doubtful service. The chief fault is patchiness, *i.e.*, too many disconnected scattered small high-lights. Take a waste print and paint out

SURE SUCCESS

follows the right use of a Cooke Anastigmat for landscapes and sea pictures, for quick portraits, and interior views, for copying and enlarging, and for all work demanding keen definition with large apertures.

TAYLOR, TAYLOR & HOBSON, LTD.

STOUGHTON STREET WORKS, LEICESTER.
AND 18 BEDFORD STREET, LONDON, W.

BEE METERS



"I have not had
a bad negative
since I began to
use it."

Bee Meter 2/7
Queen Bee 10/6
Print Meter 5/-
Watkins Manual
1/2
Speed Card, 1 1/2 d.

The WATKINS Meter Co., Hereford

NO DARK-ROOM
REQUIRED.

PALA PAPER.

*A New Paper for Contact
Printing...*

Gives Purest Black & Coloured Tones.

**Substitute for Carbon and
Platinotype Printing Papers.**

Obtainable from Photo Dealers
at Popular Prices.

If unable to obtain
write to nearest
Agent, or to Sole
Agents:

**MOLL &
JONAS,**

9, Londsdale
Chambers,
Chancery Lane,
W.C.



The **ILLUSTRATIONS**
in the
**PRACTICAL
PHOTOGRAPHER**
are Reproduced by
**THE EXEMPLAR
ENGRAVING COMPY.**
268, BRIXTON HILL, S.W.
Telephone 270, Streatham.

THE PRACTICAL PHOTOGRAPHER.

nearly all the small high-lights on the leaves on the bank to our right. You will then see our meaning and appreciate the importance of breadth, *i.e.*, the quality exactly opposite to patchiness.

A. T. (Walkley).—You are making steady progress “Slow and Sure win the race.” 1.—Here your mistake was putting a blossom on *each* side of the vase. This is far too formal. Cover up *one or other* of these and the picture at once becomes more interesting. Again the blossoms in the vase are all facing the camera, this also seems too formal and not quite natural, and is too suggestive of arrangement. The art of arranging is to do it so naturally that it does not suggest human arrangement. Of course your material must be arranged, but it must be done *art-fully*. 2.—Here again this picture does not look quite natural : one feels that it is more suggestive of a boy pretending to be asleep. Also you were too near your subject. This has exaggerated the sizes of the legs in comparison with the body. The hands look much too small in comparison with the feet. The flesh quality or texture of the legs is quite excellent and very praiseworthy. The head and face are also good. The spotty chair covering background is a very weak feature.

J. G. G. (Dudley).—The colour of the print seems too red and too pronounced for the nature of the subject ; a warm black, sepia or brown would have been more appropriate. The upper portions of the trees in middle distance seem to be too much like the tone of the sky and suggest halation. 2.—This print suggests an under-exposed negative, and what you say about it being thin and weak at the edges also points in the same direction. We think that the print sent might be greatly improved by removing $\frac{3}{4}$ -inch from the left and $\frac{1}{2}$ -inch from the bottom. Some parts (*i.e.*, long grass on further side of pool, etc.) are excellent, but others indicate under-exposure.

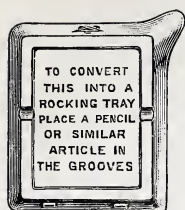
W. H. W. (Clapton).—A charming little woodland peep. Your negative seems to have been fairly correctly exposed, but development has been carried a trifle too far ; hence the sunlit trees in the distance are generally too light and almost ghostly. We think that you would get a better effect with a rougher surface of paper. Three-quarters of the many little patches of light in the near foreground require removing by the use of the scraper on the negative.

E. T. R. (Cranlington).—Evidently the exposure was not quite enough for the evening light. Generally speaking your picture is too contrasty, and also too patchy, for good strong pictorial effect. The only chance of remedy now is reduction of the negative by ammonium persulphate, but it is very doubtful if you can get anything really satisfactory from an under-exposed negative.

A. B. (Harrogate).—Thanks for your kind words of appreciation. We are always glad to know that our pages are found helpful. Both your prints show clean, careful work, but they also show a tendency towards over-strong contrasts of light and shade, due in both cases to under-exposure followed by over-development. Try doubling your previous exposures, dilute your developer with an equal quantity of water, and aim at softness rather than brilliancy. 1.—Trees too dark at left-hand side ; upper part of sky not quite dark enough ; grass and road too light ; middle distance quite right. 2.—Sky blank ; grass too light ; tree shadows too dark. Do not hesitate to ask questions if we can help you.

E. S. G. (Cheltenham).—1.—Negative is obviously badly under-exposed. There was no need for anything like such a brief exposure. The cloud part of this negative may be useful for printing into some other picture, but the black rocks and hills render the other part not much use. 2.—This is much better, but you seem to have considerably over-printed your platinum paper. Try again, and develop the print when it just begins to show a very slight suggestion of clouds.—3. Much the best of the three. The many lines of the hurdles have cut up your picture into far too many patches, but otherwise it is a very creditable piece of work, and is also tastefully and suitably mounted.

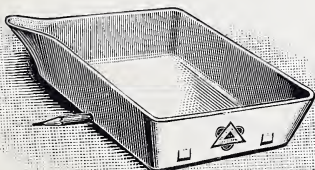
G. J. B. (Brimington).—Neat and careful work. 1.—Do not use masks with round corners, and avoid white margins as they nearly always tend to weaken the tones of the picture. Technically good, but requires size. Try an enlargement. 2.—Foreground cut up by white streaks of water into far too many patches of black and white for a good pictorial effect. No need for such rapid exposures with running water. Indeed, it only gives the effect of



The "Hanoware" Rocking Dish (Patent).

SOMETHING QUITE NEW!!

A Beautifully-designed dish, made by special process. Guaranteed not to crack, and easily cleaned.



Rocking Dish in Action.

PRICES—

	Shallow.	Deep.
4½ × 3½	7d.	8d.
5 × 4	7d.	9d.
6½ × 4½	9d.	11d.
8½ × 6½	1/1	1/4
10 × 8	1/4	1/6
12 × 10	2/3	2/6
13 × 11	3/-	3/6
16 × 12	6/-	7/-
18 × 14	—	9/6

CAN BE OBTAINED FROM ANY CHEMIST AND DRUGGIST,

or the Sole Wholesale Agents:

Evans Sons Lescher & Webb Ltd.

56, HANOVER STREET, LIVERPOOL.



Tylar's Dreadnought Generator,

Produces the

**BRILLIANT
ACETYLENE
LIGHT**

**with
absolute
safety**

TYLAR'S PHOTO CATALOGUE.

360 pages, 600 cuts.
Post-free, 1/=-.

THE ART OF PHOTOGRAPHIC DODGING.

Post-free, 4d.

Its great success has been due to its portability, its certainty and its simplicity. It is the smallest generator for supplying a large amount of gas yet made. Its height is 13½ in. and largest diameter 7½ in. and yet it will produce gas to keep a powerful double jet going for 2 hours. It is quite automatic in its action, and don't play pranks with the operator. It can be turned on and off at will and left charged up ready for use.

Its price is £2 2s.
which includes all necessary for the lantern.
Of all Dealers or direct from
**W. TYLAR, 41, High Street,
ASTON, Birmingham.**

THE PRACTICAL PHOTOGRAPHER.

frozen milk, not running water. 3.—Picture is rather overcrowded with subject matter. The boat conflicts with the ruins beyond. They fight for our attention. Technically, exceptionally good and highly praiseworthy.

E. S. P. (Exeter).—We do not care for slip-in mounts, for the prints nearly always contrive to slip about into the wrong place. You also make a grave mistake in using mounts with so much fancy pattern. The technical quality of your print is quite excellent, but it is overpowered by the ornate nature of the mount. The two figures are very stiff in pose, and evidently standing to be photographed. You were too near the horse, consequently the horse's head is rather larger than half the size of the man. It is very important to bear in mind this foreshortening effect, especially when figures are included in the picture.

Messrs. A. E. Staley have sent us a neat little cabinet of photographic preparations, viz.:—*Developers*. Diophene, Carcinal, Pyrogallie Acid, Day-light Developer, Film Developer, Hydrokinone, Brilliant Developer, and Corophane. Each of the above tubes contains enough to make 8 oz. of developer. Antihypo hardening cartridge making 16-oz. solution. Uranium intensifier for 4-oz. solution. Ammonium persulphate reducer for 6-oz. solution. Two Flash-light powders of 80 grains, *i.e.*, enough for photographing a group of ten persons. Platinum toning for 7-oz. bath. A tube of encaustic paste for giving brilliant surface to dull prints. A tube of unchangeable Amylin mountant. A cartridge for making an 8-oz. gold toning and fixing (combined) bath. A similar sized acid fixing bath cartridge. Three smokeless flashlight candles. Touch paper. Various instruction papers, and diagrams for flash-light work, etc.

These chemical preparations are from the renowned laboratory of Dr. Krebs (Offenbach), and are therefore of unimpeachable quality. We heartily congratulate Messrs. Staley on the introduction of the "Geka Sample Cabinet"—as it is called—and strongly recommend all would-be-progressive-and-practical-photographers to invest the very modest sum of 5/6 in the purchase of this admirable collection of careful preparations. Messrs. Staley (19, Thavies Inn, Holborn Circus, London) will forward a sample cabinet to any of our readers who will mention the *Practical Photographer* when forwarding the needful 5/6, although in a general way they do not supply retail orders. P.S.—It may be helpful to explain that the old suffix—Axe—is now abandoned in favour of the word Geka as designation, thus the old term "intensifaxe" is replaced by "Geka intensifying cartridge."

Sunderland Camera Club.—Exhibition, November 15th—19th. Six classes. Hon. sec., S. Ord, 52, Frederick Street, Sunderland.

Blairgowrie & District Photographic Association.—Exhibition, February 6th—11th, 1905. Hon. sec., W. D. M. Falconer, James Street Cottage, Blairgowrie.

Ipswich Camera Club.—Exhibition, November 15th and 16th. Four classes. Hon. sec., R. H. Sutton, 37, Henley Road, Ipswich.

The Kodak Exhibition of a selection of prints gleaned from their recent gigantic competition is a truly remarkable show, illustrating the far-reaching prevalence of the Hand Camera. In this competition, some twenty-five thousand prints were sent up, and of them about three thousand are now on view at the Kodak Gallery (40, Strand)—free on presentation of visiting card. This exhibition should certainly be visited if possible.

Post Scriptum.

A Novelty for Carbon Workers.—At the moment of going to press we have been shewn by Messrs. Butcher & Sons an advance model of a neat and novel actinometer or print meter. This will be put on the market at an attractive price in two or three weeks and known as "The Primus Printing Gauge." Further details concerning this useful little instrument will be given in our next issue.

Messrs **RAPHAEL TUCK & SONS LTD**



are always in the Market for
ORIGINAL PHOTOGRAPHS OF FIGURES, VIEWS, ANIMALS etc.
adapted for

Picture Post Cards.

Address. **RAPHAEL HOUSE, MOORFIELDS, CITY, LONDON.**

CARBON PRINTING

WITH
**VISIBLE IMAGE AND
NO TRANSFER.**

"Ozotype"

IMMENSE
IMPROVEMENT
IN ALL MATERIALS

By far the Simplest Pigment Printing Process.

In order to still further popularise this fascinating process, we now supply with every sample set a sufficient quantity of Concentrated Acid Bath, thereby ensuring uniformity of results, and saving the worker the trouble of weighing and preparing chemicals.

SAMPLE SET, containing—

12 pieces, $6\frac{1}{2} \times 4\frac{3}{4}$, Sensitive Paper	} 2/-	POST-FREE TO ANY ADDRESS IN THE UNITED KINGDOM.
12 " " " Pigment Plaster, assorted		
1 Bottle Concentrated Acid Bath		

Full Instructions and Price List.

THE "OZOTYPE" COMPANY,

I, Weedington Rd., Kentish Town, London, N.W.

TYO

The New
Sepia Toning for all
Bromide Papers.

(REGD.)

THE PRACTICAL PHOTOGRAPHER No. 1, reports :—

"This converted the image into a rich, warm sepia, now so popular for portraiture.
It is difficult to imagine anything simpler than the above process."

OF ALL DEALERS, price 1/-, 2/6, 5/-; or post-free, 1/3, 2/10 and 5/5, from
WELLS & CO., Southgate, London, N.

THE...

AUTOTYPE COMPANY,

LONDON AND WEST EALING.

The Original Patent Holders and Oldest Manufacturers of

Autotype Carbon Tissues

and all Materials for Carbon Printing.

ALL PHOTOGRAPHERS

interested in the most beautiful and simple of

PERMANENT PRINTING PROCESSES

are invited to send for a FREE COPY of

FIRST STEPS IN AUTOTYPE PRINTING,

a 20-page practical descriptive pamphlet, explaining in simple language the various operations of Carbon Printing . . .

Complete Price List of Carbon Printing Materials and Accessories (Tissues, Transfer Papers, Developing Apparatus, Trial Sets, etc., etc.)

Various Leaflets offering convincing evidence of the

SIMPLICITY OF THE CARBON PROCESS.

These will be forwarded FREE on receipt of application.

Permanent Autotype Carbon Enlargements

OF UNSURPASSED EXCELLENCE.

These are produced in all sizes up to 65 x 36 inches, on Smooth, Matt, Rough Drawing, and Etching Papers, in a wide range of PERMANENT PIGMENTS.

AUTOTYPE Enlargements enjoy an unrivalled reputation of upwards of 30 years.

In their production the highest skilled labour is employed and the most rigorous supervision exercised at every stage. The quality of work is unequalled.

Trade Price List will be sent Free on receipt of business card.

Specimens of work may be seen and all information obtained at

THE COMPANY'S FINE ART GALLERY AND SHOWROOMS—

THE AUTOTYPE COMPANY

74, NEW OXFORD STREET,

(A few doors West of Mudie's Library.)

...LONDON, W.C.

The Amateur's

Autotype Printing Set.

A complete equipment for Autotype Single Transfer Printing, up to half-plate size, of which details are given below. The set contains everything necessary for an exhaustive trial of the process, and will, it is believed, supply the want of a complete outfit at a moderate price.

PRINTING FRAME AND PAD.

DISC ACTINOMETER.

SENSITIVE TISSUE (2 doz. $\frac{1}{2}$ -plate or
4 doz. $\frac{1}{4}$ -plate).

SINGLE TRANSFER PAPER (2 doz.
 $\frac{1}{2}$ -plate or 4 doz. $\frac{1}{4}$ -plate).

SLATE MOUNTING SLAB.

SQUEEGEE.

BLOTTING BOARDS.

TWO COLD WATER DISHES.

ONE DEVELOPING TANK.

ENAMELLED ALUM DISH.

BOX OF POWDERED ALUM.

BOOK OF INSTRUCTIONS.

"FIRST STEPS IN AUTOTYPE PRINT-
ING."

The whole packed in box ready for rail,

Price Fifteen Shillings.

THE AUTOTYPE COMPANY

74, NEW OXFORD STREET,

(Works: West Ealing, London, W.)

...LONDON, W.C.

PLATE

Wratten & Wainwright
Croydon.

MAKERS.

Lists Free.

9/6



STANLEY'S
Patent
Dark-Room
Clock.

By post, 9s. 10d.

For negative making, bromide printing, enlarging, etc. It has a large dial and records minutes and seconds. Send for description to **S. Stanley, 48, Mortimer St., Cavendish Square.**

THE "AKURET" PRINT-METER.

2/6 post-free.

The "SPECIAL AKURET." Finer scale, better finish, etc. 3/6 post-free.

Sensitive Paper, 6d. per packet.

One instrument works simultaneously with as many as twenty frames if required. All seen at a glance. Every kind of negative provided for. Indispensable for accuracy in sunning down and printing in of clouds. Cheapest in use. Packets of sensitive paper contain enough for use 4,000 times.

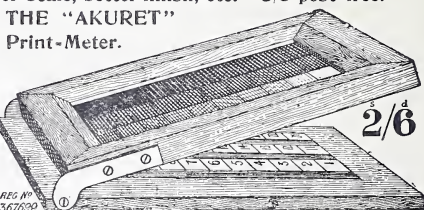
Hundreds of Testimonials, amongst which are the following :

Mr. Harold Baker, BIRMINGHAM: "I have been using your 'Akuret' Print-Meters for some time, and find them far and away the best I have seen for carbon work."

Mr. F. M. Sutcliffe, WHITEBY: "Your Print-Meter is quite a treasure. The great usefulness of the instrument is that the scale is so extended that every kind of negative is provided for."

Obtainable from all dealers, or direct from Makers,

THE PORTABLE STUDIO MFG., CO., Brettall Lane, Stourbridge.



THE "AKURET"
Print-Meter.

2/6

HUGHES' ALPHENGO

PATENT

Reflecting Enlarging Lantern

DOES EVERYTHING—Enlarges, copies, reduces, makes magic lantern slides, and can be used as a **Daylight Enlarger** as well, also as an **Opaque Lantern**.

Ready night or day, to use with own camera and lens. The very acme of perfection, marginal and even illumination. No photographer should be without one.

PRICES:— $\frac{1}{4}$ -plate, 26/-; 5×4 , 30/-; $\frac{1}{2}$ -plate, £2 2s.; $\frac{3}{4}$ -plate, £3; 12×10 , £5 5s.; 15×12 , £6 10s. each, including Incandescent Gas Lamps, and nests of Metal Carriers, all sizes down to $3\frac{1}{4} \times 3\frac{1}{4}$.

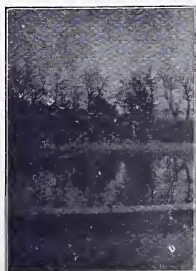
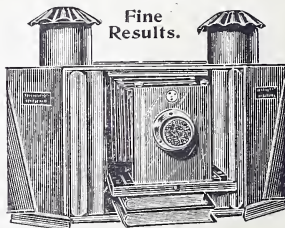
No one would use Condensers. After this enlargements softer, more even and delicate in tone. Illustrated List, post-free, 2d.

W. C. HUGHES, BREWSTER HOUSE, 82, MORTIMER ROAD, KINGSLAND, LONDON, N.

Just the Enlarger wanted!

NO CONDENSERS.

Fine
Results.



Copy taken on P.O.P.

However faint the negative
a good impression can
be obtained on

REMBRANDT PAPER.

TO BE HAD AT ALL PHOTO-GRAPHIC STORES, or Direct from



Copy taken on Rembrandt.

The Manufacturer—**FERDINAND HRDLICZKA, Vienna VII., Zieglergasse No. 96.**

xxvi.

Kindly mention "The Practical Photographer."

Lantern

Slides

For COMPETITIONS.

For SOCIETIES' MEETINGS.

For HOME EXHIBITION.



Now is the time to overhaul your stock of negatives if you intend to make use of them for Lantern Slides this season, and you will not forget, of course, that No. 3 of the present series of *The Practical Photographer* is acknowledged by experts to be the most complete and up-to-date Lantern Slide Manual extant.

It includes explicit instructions for beginners. Toning slides, (brown, red, green, blue, sepia, etc.). Adding clouds. Printing slides like framed pictures. Printing, colouring, and painting slides. Making diagram slides. Exposure, Development, Spotting, Binding, Pictorial Hints, etc. N.B.—Over 120 Formulæ.

The Practical Photographer.

LIBRARY SERIES. Edited by the Rev. F. C. LAMBERT, M.A.

Published on the first of each month. Profusely Illustrated.

Price 1/- nett.

NUMBERS ALREADY PUBLISHED.

No. 1. BROMIDE PRINTING.

Pictorial Work of A. Horsley Hinton.
(OUT OF PRINT.)

No. 2. BROMIDE ENLARGING.

Pictorial Work of Colonel J. Gale.
(OUT OF PRINT.)

No. 3. LANTERN SLIDES.

Pictorial Work of Will A. Cadby.

No. 4. TITLES, MOUNTS, FRAMES, Etc.

Pictorial Work of Alex. Keighley.

No. 5. P.O.P.

Pictorial Work of F. H. Evans.

No. 6. DEVELOPING AND DEVELOPERS.

Pictorial Work of Ernest R. Ashton.

No. 7. AFTER-TREATMENT OF THE NEGATIVE.

Pictorial Work of Robert Demachy.

No. 8. HAND-CAMERA WORK.

Pictorial Work of Frank M. Sutcliffe.

No. 9. PLATINUM PRINTING.

Pictorial Work of Charles Job.

No. 10. SPECIAL HOLIDAY NUMBER.

No. 11. LANDSCAPE PHOTOGRAPHY.

Pictorial Work of Reginald Craigle.

No. 12. ARCHITECTURAL PHOTOGRAPHY.

Pictorial Work of Arthur Burchett.

No. 13. THE CARBON PROCESS.

Pictorial Work of J. Craig Annan.

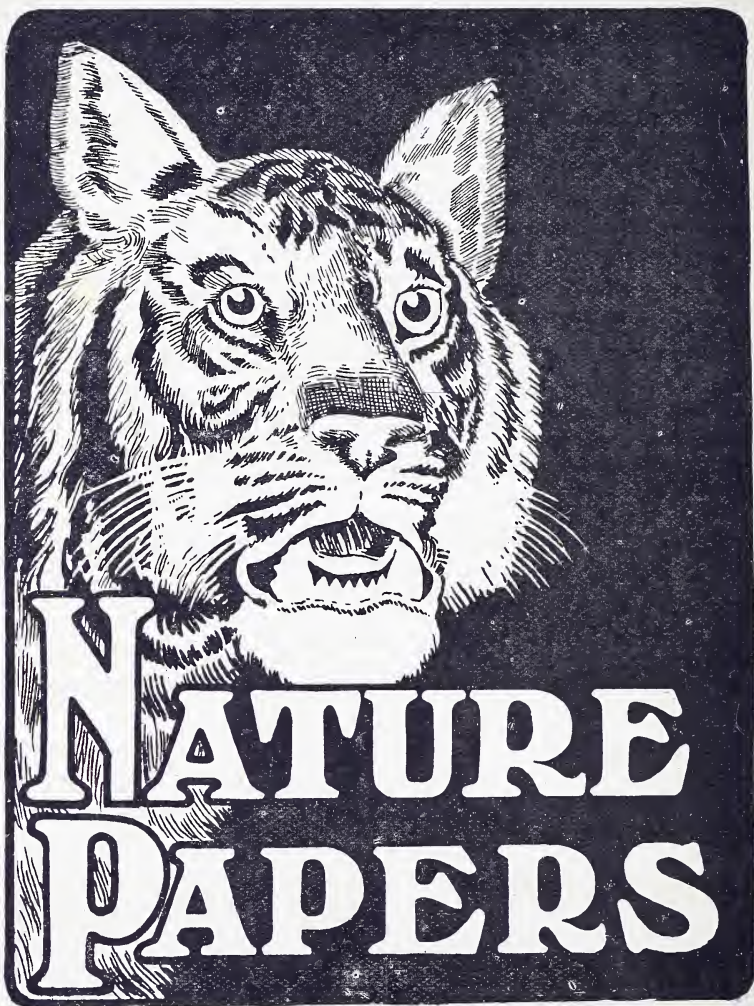
The above may be obtained of any Photographic Dealer, or direct from the Publishers,

HODDER & STOUGHTON, 27, Paternoster Row, London.

xxvii.

Kindly mention "*The Practical Photographer*."

ON · THE · ALERT



OF ALL DEALERS; or of

**PERCY LUND
HUMPHRIES & CO.**

BRADFORD AND LONDON.

xxviii.

Kindly mention "The Practical Photographer."

"IMOGEN SULPHITE

*as a developer
will just please you immensely."*

See "THE AMATEUR PHOTOGRAPHER," June 4, 1903, page 447.

Mr. W. THOMAS, F.R.P.S., also adds:

"Is it suited for use with our present high-speeded plates? Most distinctly, yes."

"... It works equally cleanly with plates of high or low sensitiveness."

"Does it produce full scales of gradation from fine shadow detail to full density in high-lights? It certainly seems to do so. ... There is no difficulty in obtaining beautifully-graded negatives."

"The method of preparing the developer is simplicity itself."

"No weights or scales are needed."

"It is a comfort to be able to employ a developer which requires so little personal attention while it is carrying out the work of transforming exposed plates into completely developed ones."

OF ALL DEALERS, 1 oz., 7d.; 4 ozs., 1/8; 8 ozs., 3/-; 16 ozs., 5/4.

The Actien
Gesellschaft
für Anilin
Fabrikation,
Photo Dept.



SOLE AGENTS:

Chas. Zimmerman & Co.,

9 & 10, St. Mary-at-Hill,

LONDON, E.C.

THE AGFA Intensifier.

Complete Intensification in
one Manipulation.

This is a concentrated solution which for use is diluted with nine parts of water. Immerse the plate to be intensified, and when a sufficient intensification has taken place, the negative is well rinsed, and the operation is complete. There is no further manipulation required, and the maximum action possible is completed in fifteen minutes.

Price: per 2 oz. bottle, 1/-; 4 oz.
1/9; 16 oz. 5/-

THE AGFA REDUCER.

Always ready for use.

This is in a powder form which merely requires dissolving in water. In the solution thus obtained immerse the plate or print to be reduced. Reduction is slow, and can easily be watched. When the action has gone far enough, the plate is washed, and the action is complete. It is an efficient and economical reducer.

4 oz. bottle, 1/9; 10 cartridges, 2/3.

Printed for the Proprietors, Messrs. HODDER & STOUGHTON, 27, Paternoster Row, London, E.C.,
by PERCY LUND, HUMPHRIES & Co., LTD., The Country Press, Bradford; and 3, Amen
Corner, London, E.C.

FOR ARTISTIC PRINTS AND
EXHIBITION PICTURES.



MADE IN A VARIETY
OF ARTISTIC COLOURS.
TRANSFER PAPERS ALSO
OF MANY
KINDS AND TEXTURES.

Sample Packet of Tissues and Transfer
Papers for both Single and Double
Transfer, with Book of Instructions
for half-plate, 2/- post-free.

**Many Valuable Cash Prizes for Carbon
Prints in the Barnett £500 Competition.**

CLOSING DEC. 31st.

Of all Dealers, or from Elliott & Sons, Ltd., Barnet, Herts.